40 Lock

POPULAR Computing WEEKLY

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This Week

News Desk

Bill Cannings — Software Centre head

Software case resolved

QUICKSILVA and the Software Centre appear to have resolved their dispute over the latter's Buy n Try scheme (*Popular Computing Weekly*, March 24-30)

Under the terms of the settlement Quicksilva is withdrawing its action against the Software Centre In return the Software Centre is reducing its buy-back time — the period during which customers can return programs and receive a discount of 80 percent towards subsequent purchases — from six months to one month

The exact terms of the settlement will be proposed to the court on April 13 when solicitors acting for both parties will request an *order by*

Continued on page 5

CTA stands against libraries

TWENTY-EIGHT micro manufacturers retailers and software companies attended the second meeting of the Computer Trade Association held at the Spider's Web Motel Watford last week

The main order of business was the vexed question of software libraries John Everett of Lutterworth Software believed that libraries would be better controlled from within the CTA, where they would be subject to its constitution

Nick Alexander, of Virgin Games was among those who felt that, even if the problem of home duplicating could be solved, libraries would still be a bad thing

"Because rental took off in the video market, dealers got involved in such cut-throat competition that they didn't have enough revenue to plough back to buy new releases — the same thing could happen with games

A suggestion that games

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Computer Swap 01-930 3266

Free readers entries to buy or sell a computer. Ring 01 930 3266 and give us the details

1K ZX81 £25 Tel Buckland (Oxon) 816 after 8 pm

SINCLAIR 48K SPECTRUM. Ring Huddersfield 858034

SHARP MZ80K, 48K £100 of s/w + much more £350 ono Tel Halifax (0422) 65057 (8 pm)

98K LYNX, 1 month old Unwanted gift as new £220 Tel Doncaster 756528

SHARP MZ80K 48K with Quantum high resolution Zen assembler lots of programs + original manuals, £400 ono Tel Harrowgate 872188 or will swap for BBC Model B

DRAGON 32, boxed 4 months old lead manuals over £50 s/w £180 Tel St Helens 28985

TEXAS 7199/4A with Extended Basic plus Speech Synth and cassette with leads 13 months old parsel game and wide selection of programs £240 Tel Heywood 624218

DRAGON 32, perfect condition + leads manual and boxed with £40 of software £185 Tel 01 653 7975

LYNX, 48K 5 weeks, £200 ono Tel 01 509 0479 (anytime)

SPECTRUM 16K games tapes magazines £110 ono Tel Great Dunmow 810720 (4 30)

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How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted.

All submissions should be typed and a double space should be left between each line. Please leave wide margins.

Programs should whenever possible be computer printed.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

This Week

Editorial

Micro whizz-kids are all the rage at the moment. Derek Bartle, the 17-year-old marketing manager for Mikrogen, and Eugene Evans, the 16-year-old Imagine programmer, have appeared in newspapers up and down the country in the last few weeks.

The reason for this sudden interest in 'computer prodigies' is quite simple. Micro illiterates (ie the man in the street) have been amazed to discover that kids half their age can earn enormous amounts of money for writing and distributing games.

To the uninitiated, the very idea that games could be worth real money is something of a surprise. This surprise is compounded still further when they discover that the game programmer is 'just 16'.

However, it would be more surprising if the game programmer turned out to be 66 rather than 16. Young people, on the whole, tend to absorb new ideas better than their elders. Projects which might be dismissed as impossible by most adults are merely challenges to minds unfettered by the constrictions of age.

The present flock of whizz-kids also seem to be remarkably level-headed. There have been no cries of 'Spend, spend, spend' which have accompanied so many pools winners.

Youth is not a crime or a disease, it is a condition through which all of us must pass.

Next Thursday

Can you navigate your way through a perilous cavern, bombing fuel dumps and enemy positions? Find out next week in Defender, a new game for the ZX Spectrum.

Software Centre

Continued from page 1

consent Both Quicksilva and the Software Centre are waiving all claims and each party will bear its own legal costs.

This outcome appears to favour the Software Centre, as a reduction in the buy-back time is unlikely to have any detrimental effect on its operation

But, other software houses are still looking closely at the Software Centre's Buy n Try scheme A Sinclair spokesman commented "It is now clear that Sinclair Research will not be taking any legal action against the Software Centre

"The practical way to stop their actions is to stop them from getting any product — and that is what we are now turning our attention to "

■ The Software Centre is planning to open two more stores, one in Ilford and one in Leicester

Texas lands the big one!

TEXAS Instruments has won an order worth more than £2 7m to supply Ram chips for the Oric 1 microcomputer

The order placed by ITL Kathmill, who acts as Oric's procurement and manufacturing agent, is for the TI TMS 4164 64K Dynamic Ram semiconductor chips, used in the 48K version of the Oric machine

CTA

Continued from page 1

might be leased rather than sold was rejected as impracticable by Quicksilva's Nick Lambert Chris Lawson, of Salamander, said that the only legal control the software houses had was over the first party sale — what subsequently happened to their cassettes could not legally be written into the terms of the contract of sale

The most unequivocal stand was taken by Dave Patterson, of Silversoft He suggested that a cartel of software houses was required

A motion was finally agreed by 22 of those present that "The CTA is opposed to any form of hiring or lending of tapes, discs or cassettes by direct or indirect means without the authority of the author of the program or his or her agents and publishers "

Micro's in the high street!

AT LAST there are signs that the Micro-Professor MPF-II computer is making its way to the shops

The 64K machine, which is compatible with Apple software, has been on sale in the US for over two years but has only recently acquired a British distributor

Sirtel (UK) entered into negotiations with the machine's Taiwan-based manufacturer, Multitech, in October last year The result was an exclusive agreement to import the computer and first deliveries arrived in late January

Now the machine has been adopted by the Spectrum retail chain and will be available through its 120 stores from April

The 6502-based Micro-Professor will sell for £269 including VAT It has a calculator-type keyboard, although a separate full size keyboard is available as an option

The machine has a 24 × 40 character display format with six colours It has a low-resolution graphics mode of 40 × 48 pixels and a high-resolution mode of 280 × 192 pixels Interfaces include video output Centronics interface and joystick port Disc drives are available but are not compatible with Apple disc software

Prices include full-size keyboard, £36 25, printer, £185 74, floppy-disc drive, £296 85, joystick, £14 95

UK game hits No 1 spot in US charts

GRID Runner is the top selling Vic20 game in America

The game, written by Jeff Minter, of UK Software house Llamasoft, began its climb to the top of the US charts at the end of February Now, over 15,000 copies have been sold — 8 000 of those in the last two months *Grid Runner* is only available on Rom cartridge in the US, priced at just over £23, although a cassette version is available in the UK

The cartridge version of the game is soon to become available in the UK, and the Rom version is expected to sell for around £20 in Britain

Jeff Minter has also written a version of *Grid Runner* for the Commodore 64 machines together with two new games *Attack of the Mutant Camels* (£8 50) — and *Rox* (£4 95)

Jeff is also working on a follow-up to *Grid Runner* — to be called *Matrix* This should be available in mid-May for both the Vic20 and Commodore 64, priced at £8 50

Twenty-year-old Jeff Minter founded the Llamasoft venture less than 18 months ago

Jeff Minter of Llamasoft

Timex cuts cost of TS1000 as sales drop

AS expected Timex in the US has cut the cost of the TS1000 machine in an attempt to revive flagging sales

The price for the American ZX81 equivalent drops to £48 and the present £10 rebate offer will continue to the end of April This means that for the next month the TS1000 will sell for only £38

"We are committed to remaining the price/value leader in personal computers " said Daniel Ross, Vice President of Timex Computer Corporation

Ever since the TS2000 machine — the Spectrum equivalent — was announced by Timex in January, sales of the TS1000 have slumped This, coupled with a delay in the launch of the TS2000, has been causing Timex anxiety

The limited special offer price of £38 is intended to revive sales of the TS1000 and provide encouragement to dealers This point was emphasised by Daniel Ross "No personal computer manufacturer offers more to the retailer in terms of profit potential "

Special rates for BBC

MEMBERS of two BBC microcomputer user groups can now obtain a Series 1 2 operating system Rom at a special discount price

Since the BBC machine was first launched the operating system has appeared in both Eprom and Rom in a variety of forms — 0-1, 1 0 1.1 and now the 1 2 Rom

Those with Eproms or those wishing to buy discs or run Econet, can up-grade free of charge However the rest must take their machine to an Acorn dealer and pay £11.50

Now, the two main BBC user groups — Beebug and Laserbug — have negotiated special rates for their members — £5 85 and £5 50 respectively The Rom swap has to be undertaken by the user, but full instructions are supplied by Acorn

If the machine then fails to perform a BBC dealer will then sort out the problem for an additional charge

The £6 Rom discount effectively off-sets the six-month membership subscription for either of the two groups — £5 50 for Beebug and £6 for Laserbug

Bugged Spectrum

There have been a number of letters published over the last few months about so-called 'bugs' in the Spectrum Rom so I was glad to see Ian Beardsmore put the record straight (*Peek & Poke* March 10)

However there is one bug in the Basic that caused me a great deal of difficulty until I could isolate it It occurs when concatenating character strings — eg, when building up a message to be handled by a sub routine Try the following program

```
10 PRINT "The value is " + STR$ 2
RUN
```

This will appear on the screen as *The value is 2* Now insert a decimal in front of the figure 2, ie X

```
10 PRINT "The value is " + STR$ .2
RUN
```

This will *not* print the text — it is completely lost, and the only printed result is 0.2! If you wish to see the full effect of this bug, try running the following program

```
10 FOR x = -1.1 TO 1.1 STEP .1
   PRINT "The value is " + STR$ x
   NEXT x
```

I wrote to Sinclair in July 1982 about this bug but did not receive a reply

A recent article by Nick Wilson (*Popular Computing Weekly* January 20-26) showed some of the potential of the *Draw* command but the ability of the machine to draw fine squares triangles, stars, etc has perhaps not been appreciated The following one-line program will allow a variety of sharp, perfectly formed shapes to be generated and held on the screen for a few seconds The program looks totally incapable of doing this but again you will be surprised at the results

```
10 INPUT "Top no "; T; " Bottom no "; b: PLOT 128,16: DRAW 1,16,0
   504 * PI * t / b + 1/1024: CLS:
   GOTO 10
```

Run the program and use integers for *t* and *b*, with the top number as a Prime and less than the bottom number Some useful values are *t=1 b=4* (square), *t=1 b=3* (triangle), *t=31 b=63 t=3, b=7* (seven pointed star)

The program uses the method by which the Spectrum draws arcs — it divides the arc into a large (504) number of points and then draws straight lines from one point to the next If the points happen to be exactly 60 degrees apart, for example, a triangle will result

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Adventure fetish

Congratulations for producing such a superb magazine which gives full value for us many Vic20 owners

Apart from the splendid variety of program listings, I am particularly indebted to Mike Grace for his humorous and well-balanced reviews of software for the Vic Mike's style is highly entertaining and his apparent fetish for adventures is equal to my own attraction to these intricate puzzles Thus, it is with great expectation that I await the release of Scott Adams next seven adventures

Continue with the good work *Popular Computing Weekly* and do not drop Mike Grace for anything!

James Winn
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It's in the stars

The opinion of your correspondent T P Byatt on astrology and astrological programs (Undeserving Astrologers — *Popular Computing Weekly*, March 10-16) reveals great prejudice and makes suspect the very intelligence he claims insulted

While the traditional dogma of astrology is far from proven, a great deal of modern scientific research in a wide variety of fields has yielded evidence which supports the basic astrological theory Many reputable scientists are currently engaged in work which is astrological in nature A computer magazine is perhaps not the place to catalogue such research though I can supply the information should your correspondent so request

For my part I would be glad to know the research undertaken by Mr Byatt, upon which he bases his dismissive attitude Perhaps it would be apt to quote the reported rebuke made by Sir Isaac Newton when criticised for his involvement with astrology "Sir, I have studied the subject You have not" But perhaps Mr Byatt thinks Newton undeserving of the technology he fathered

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Compiling copyright

The occasions on which I have been drawn to write to a magazine are so few that you are in a minority of one There is however, a very good reason why I feel compelled to respond now

Having had 14 years experience in the computer industry, I watch bemused as various views and attitudes are portrayed which range from innovative to ridiculous One fact that is inescapable is that the whole sphere of micro computers for home use is still very amateurish

It has taken us a long time in the computer industry to establish standards and protocols and it is disappointing to see the same mistakes being made with micros today, as were made with mainframe computers 20 years ago My particular concern on this occasion is the question of copyright and there are several points I would like to make

I would like to reply to the comments regarding compilers and whether the use of a compiler entitles its author to copyright of the final program I can only compare this suggestion to one that said that all paintings of Picasso really belonged to the paint manufacturers, or that works of Shakespeare belonged to a translator who published a version in a foreign language The point being that a compiler is a tool, and no more, used to convert a high level language to machine code I am sure the thought that it gave the author the right of copyright would amuse the main computer manufacturers eg IBM Honeywell ICL etc who have been providing compilers to every computer installation throughout the world for many years

The fact that the individual who made this suggestion seemed unsure about the difference between an assembler and a compiler adds to the argument of a lack of professionalism The difference related by Miss Counsell between the two is that compilers perform a 'literal' translation based on the high level language commands (eg will convert a print command to a sequence of machine code instructions) An assembler, on the other hand, allows the programmer to work at a lower level and therefore he can use more efficient code

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Disappearing 2650

With reference to *Peek & Poke*, March 10-16 "Gone fishing" The Teleng computer was taken over by Rowtron Marketing, 200 High Street, Boston Spa, West Yorks LS23 6DR Tel 0937 845400 Fourteen cartridges were available a year ago

This computer used the Mullard/Philips 2650A microprocessor — this chip has also been used in an "Elektor" magazine games computer, and I believe, in the current Philips games computer The cartridges use the Mullard 2616 16K Rom, each storing many games or variations of one game

My family has three of these machines, which were early in the market (1979) and deserved to survive I believe that Rowtron were to continue the development by introduction of the planned Rom so that the machine could beome a 'proper' home computer

I have a few spare cartridges if Mr Thomas is interested and think that there may be quite a few of your readers who have machines to dispose of for spares etc Maybe the staff of *Popular Computing Weekly* can shed light on why the 2650 does not appear in any of the popular micros

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Death wall

A new game for the Dragon by Mark Perry

Death Wall is a game for one player on the Dragon 32. Using the arrow keys, the player controls a line which he must prevent from hitting the walls of the screen, or the line controlled by the computer. The player must trap the computer's line, so that it has no choice but to hit a wall or a line. This is not so easy as it sounds!

The program uses sound, high-resolution graphics and colour, though the game is played in *Pmode 4* so colour is only used in the opening page. The game also features on-screen display of the player's score and the computer's score.

When Run, there will be a short delay before the opening page of graphics. Full instructions are included in the program.

Notes

10	Defines string for drawing the game
60-110	Defines strings for drawing numbers
120-210	Draws opening graphics page
220-270	Prints instructions
280	Speeds processor up
290	Waits for ENTER to be pressed
310-400	Sets up game screen
410	Clears game screen
430-510	Draws scores in correct places.
520-540	Section controlling play
550-760	END routine
860	Puts random gate on screen
770-850	Checks for keyboard entry
880-970	Subroutine controlling movement of computer's line

```
10 T$="BR4U10L4BR8D10BR4U10R8D4L
8R4D3R2D3BR4U10R8D10L8BR12U10R2D2
R2D2R2D2R2D2R2D2R2U10D10"
20 '************************
30 '*      'TRON II'       *
40 '*                      *
50 '*    BY MARK PERRY     *
60 '*                      *
70 '************************
80 DIM NUM$(10)
90 CLS
100 FOR I=1 TO 10:READ NUM$(I):NEXT
110 DATA"U10R8D10L8BR8","BR4U10D10BR
4","R8L8U5R8U5L8BR8D10","R8U5L8R8U5
L8BD10BR8","BU5U5D5R8L4U3D8BR8","R8
U5L8U5R8BD10","U10R8D5L8D5R8U5D5",
"U2R2U2R2U2R2U2R2U2L8BD10BR8","U10R
8D10L8U5R8D5","R8U10L8D5R8D5"
120 PMODE 3,1:PCLS
130 DRAW"S20;BM5,100"+T$
140 COLOR 2
150 LINE(0,45)-(255,0),PSET,BF
160 LINE(0,102)-(255,191),PSET,BF
170 SCREEN 1,0
180 FOR T=1 TO 5
190 PLAY"L255O1CDEFGABO2CDEFGABO3CD
EFGABO4CDEFGABO5CDEFGAB"
200 NEXT T
210 DRAW"S4"
220 PRINT"THIS GAME IS BASED ON THE
'DEATHBIKE' SCENE SEEN IN THE FILM
'TRON'
230 PRINT"USE THE ARROW KEYS TO CON
TROL   YOUR LINE, STARTING FROM THE
TOP"
240 PRINT" BE CAREFUL NOT TO HIT A
WALL OR A 'TRAIL' LEFT BY YOU OR THE
COMPUTER'S BIKE:THEN YOU LOSE!"
250 PRINT:PRINT"IF YOU REMAIN ALIVE
LONGER THAN THE COMPUTER,  YOU WIN!"
260 PRINT"PRESS E TO END DURING THE
GAME"
270 PRINT:PRINT"PRESS [ENTER] TO CON
TINUE"
280 POKE 65495,0
290 IF INKEY$<>CHR$(13) THEN 290
300 CLS
310 MC=0:TR=0
320 PMODE 4:SCREEN 1,0:PCLS
330 LINE (5,20)-(250,20),PSET
340 LINE(5,20)-(5,185),PSET
350 LINE(5,185)-(250,185),PSET
360 LINE(250,20)-(250,185),PSET
370 MCP$="BM5,18;U10R1D1R1D1R1U1R1U
1R1D10BR4R8L8U10R8BD10BR4U10R8D4L8"
380 DRAW MCP$
390 TR$="BM150,18;"+TR$
400 DRAW TR$
410 LINE(6,21)-(249,184),PRESET,BF
' CLEAR BOX
420 QW$=CHR$(10)
430 LINE(60,0)-(149,18),PRESET,BF
440 LINE(200,0)-(255,18),PRESET,BF
450 IF MC>99 THEN MC=0
460 IF TR>99 THEN TR=0
470 M$=STR$(MC):T$=STR$(TR)
480 FOR T=2 TO LEN(M$)
490 Y$=MID$(M$,T,1):Y=VAL(Y$)+1
500 IF T=2 THEN A$="BM60,18"+NUM$
(Y)+"BR4"
510 IF T=2 THEN 530
520 A$=A$+NUM$(Y)+"BR4"
530 NEXT T
540 DRAW A$
550 FOR M=2 TO LEN(T$)
560 Y$=MID$(T$,M,1):Y=VAL(Y$)+1
570 IF M=2 THEN A$="BM220,18"+NUM$
(Y)+"BR4"
580 IF M=2 THEN 600
590 A$=A$+NUM$(Y)+"BR4"
600 NEXT M
610 DRAW A$
620 A=0:B=1:C=0:D=-1
630 TX=RND(100)+50:TY=(21)
640 FG=RND(70)-10:MX=TX+FG:MY=184
650 PSET(MX,MY,1):PSET(TX,TY,1)
660 RT=RND(50):IF RT=10 THEN UK=RND
(220)+15:JK=RND(140)+30:LINE(UK,JK)
-(UK+RND(15),JK+RND(15)),PRESET,BF
670 QW$=INKEY$
680 IF QW$<>"E" THEN 770
690 POKE 65494,0
700 CLS
710 PRINT"MCP SCORES ";MC
720 PRINT"TRON SCORES ";TR
730 IF MC=TR THEN PRINT"A DRAW!":
GOTO 760
740 IF TR>MC THEN PRINT"TRON WINS!":
GOTO 760
750 PRINT"MCP WINS."
760 END
770 IF QW$=CHR$(8) OR QW$=CHR$(21)
THEN A=-1:B=0              'LEFT
780 IF QW$=CHR$(94) OR QW$=CHR$(95)
THEN A=0:B=-1              ' UP
790 IF QW$=CHR$(9) OR QW$=CHR$(93)
THEN A=1:B=0             ' RIGHT
800 IF QW$=CHR$(10) OR QW$=CHR$(91)
THEN A=0:B=1              'DOWN
810 IF PPOINT(MX+C,MY+D)=0 THEN
GOSUB 970:GOTO 830
820 GOSUB 850
830 IF PPOINT(TX+A,TY+B)=1 THEN
MC=MC+1:PLAY"T200;BAGFEDC":GOTO 410
840 TX=TX+A:TY=TY+B:GOTO 630
850 '    MCP MOVEMENT
860 DIR=RND(2)
870 IF C=0 THEN 930
880 C=0
890 IF DIR=2 THEN D=1 ELSE D=-1
900 IF PPOINT(MX+C,MY+D)=1 THEND=D
*-1:ELSE 970
910 IF PPOINT(MX+C,MY+D)=1 THEN PLAY
"T250;CDEFGAB":TR=TR+1:GOTO 410
920 GOTO 970
930 REM VERTICAL
940 IF DIR=2 THEN C=1:D=0:ELSE C=-1
:D=0
950 IF PPOINT(MX+C,MY+D)=1 THENC=C*
-1:ELSE 970
960 IF PPOINT(MX+C,MY+D)=1 THENPLAY"
T200;CDEFGAB":TR=TR+1:GOTO 400
970 MX=MX+C:MY=MY+D:RETURN
```


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Down by the sea . . .

***David Kelly** talks to the Salamander partnership about their operation.*

Salamander Software is a partnership of ex-Sussex University students — based almost a pebble's throw from the sea in Brighton

Formed last August and operating as a co-operative of equal partners Salamander has already become an important independent software house for Dragon 32 programs

The original idea for the group seems to have belonged to Paul Kuczora. After leaving college and treading water through a variety of tedious jobs Paul ended up flogging power supplies to IBM "A change was called for!" he observes

My original intention was to do BBC software A friend had a machine and in June last year I wrote some material for it We were starting to get something together when he left to concentrate on business software for the micro

So Paul was back to square one At least he was until Pete Neale got involved Pete had come over to Britain from Texas in 1974 to study at Sussex University and had stayed — ending up as a systems programmer on IBM main frames

"I didn't know anything about microcomputers at all — being a main-frame person," he explains "I wanted to buy one though to run some utility programs to help with playing *Dungeons and Dragons* In August I went in to The Gamer in Brighton and I bumped into Paul

I saw him through the shop window — looking as though he was going to buy a machine" says Paul, "so I went in to make sure he bought a Dragon!"

Salamander started there with the two producing programs for the Dragon and BBC machines Soon afterwards other friends joined Lucy Parker who studied biology and then went to art college in Brighton, and Jul Carson, who did a degree in experimental psychology and ended up drawing cover illustrations for the fantasy magazine *Pssst!* Between them, they do all of Salamander's packaging, insert art-work and help with the visual presentation of the programs on the screen Chris Holland is the most recent member of the team. Fresh from driving buses for Southdown, he is Salamander's marketing and sales executive

The final member of the six-strong partnership is Pete Ohlson who, having put up some of the money to get the venture going originally, is now pretty much a sleeping partner

Sleeping partner

At the end of August, the Salamander partnership was formed "Then," says Pete "everyone else went away for four weeks holiday, leaving me at home to do the programming — a sore point!"

"The scale we envisaged was quite small — selling mail-order — I don't think any of us would have predicted it would take off as it has done," says Paul

Lucy and Jul spent days on the phone going through the yellow pages trying to find companies to duplicate the tapes, make the packaging and print the box inserts She says "We always thought the look of the thing was very important — if you go into the shops, anything with a half-way reasonable package jumps out."

Salamander was officially launched on November 14 — with a range of six programs for the BBC and Dragon *Tanx* was the first program they wrote closely followed by *Dragon Rider* for the BBC "The adverts came out too soon — we didn't understand copy dates or really know what we were doing then — and we've been panicking ever since

"In many ways it was fortunate It put us ahead of our competitors — I think we put out the first independent software for the Dragon"

In late November they all quit their jobs to work full time for Salamander That gave Pete and Paul more time to get down to programming Says Paul "We work as a really good programming team He tells me what to do and I key it in!"

Designing a new game starts off with a brainstorming session "Before Christmas," says Jul, "we all sat down and thrashed ideas about and came up with a list of 150 possible games! The problem is which ones to do"

Pete tries to plan how the program will work — how it will flow and what it will look like on the screen It is important to match the program to the machine for which it is intended "When writing on the Dragon" he says "you have to be careful how you use sound if you want a fast game Using the sound command hangs up the processor — if it is a long tune then for a long time the computer isn't doing anything

Salamander is also working on a range of programs for the Oric 1 "That has its idiosyncrasies too. Because of the peculiar way of using attributes to plot colours on screen, you have to be careful with the graphics — for any line or shape the first six pixels contain the Ascii attribute code and anything drawn over those pixels will not appear Also, the Oric does not have square pixels This creates all sorts of problems — not least that the *Circle* command on the Oric plots an oval!"

When a new game is planned out it is assembled in machine-code "The actual coding is relatively simple," says Pete, "most of the work has already been done by then" The completed game is then sent out to a panel of play-testers — ranging from school kids to system programmers — used by Salamander They subject each new game to rigorous testing to make sure there are no 'hidden' bugs in the program Then it goes for duplication

"Now we are selling to Boots and Spectrum stores, we have had to gear our production up by a factor of 10 ... more than once!"

Moving overseas

Now Salamander is looking at other markets As the Dragon moves overseas, so will Salamander's software The Dragon material is also being converted to run on the Tandy Color Computer for sale in the US

A range of Oric software is now well on the way — *Trek*, *Backgammon* a games compendium and a 3D maze game A utility package is on the way for the BBC machine — featuring a machine-code disassembler printer dump utility and sound shape utility A BBC version of *Golf* is also planned and material for the Lynx is being considered

Shortly, an arcade-type game called *Star Jammer* will be released for the Dragon together with other new titles — a mountain climbing game *Everest*, a graphics package and an educational game based on Hangman

Finally, work is now in progress on an ambitious series of Dragon programs — for launch in the summer These are the *Castle Barron* real-time, role-playing, adventure games The series will be in modular format with full graphics The games will be for one or more players against (or with) the computer

"It is a huge project," says Pete, "but something I have always wanted to do — to produce a coherent fantasy role-playing game that will work on a computer" ■

Play the game!

***Mike Grace** roams the moons of Jupiter in his latest review of Vic20 software*

As the software explosion continues and competition between the different manufacturers increases so we, the consumers should benefit. Improvements in presentation and ideas should be matched by falling prices. With these thoughts in mind I approached a new batch of games for the Vic20 hoping to be both surprised and stimulated by challenging and original programming.

The first tape was for the unexpanded Vic (when will it be possible to load games and other software into the Vic without this annoying problem of pulling cartridges of extra Ram in and out?) and was the terror of reviewers — a *compilation tape*. I may be alone in this, but I always feel that when several games sit on one cassette for very little money then it is unlikely any of them will be very good and in this case I was right.

The cassette is called a *Games Pack* (hardly original) from Melbourne House and at £5.95 seems like a bargain. The best thing about this one is the cover, featuring a nice colour picture of a rocket and a brief but careful description of each game — still a feature lacking in some of the review copies I receive.

But here the good part ends. On *Loading* I found that the promise of the blurb on the cover was not fulfilled for all we have are five slow and unimaginative copies of *Space Invaders Asteroids* etc. The *Space Invaders* is the worst I have seen, incredibly slow (and with a bug that prevented my laser from moving to the left so it had to remain at the right-hand side firing into an ever-decreasing alien horde). In fact I would prefer to avoid commenting too much on this tape as I feel it is not really worth the effort.

As a complete contrast the next game I picked up was *Frog Runner* from Anirog Computers again for the unexpanded Vic. This is obviously a version of *Frogger* — which for those who are not familiar with the game involves getting a frog safely across a main road with fast-moving traffic and then across a stream, so that he can reach home on the other side of the screen. Although points are scored the real enjoyment of the game comes from just surviving the hazards and reaching home.

A sense of humour!

I had played the Rabbit version prior to trying this game and there were several slight variations between the two. In *Frog Runner* once the frog has survived the traffic he has to move off the bank of the stream before a snake comes along to chomp him. Then instead of avoiding the logs (as in *Frogger*) he has to jump from one log to the next to reach his goal. An added refinement is the random arrival of lady frogs on the logs — if you not only land on the log but also on top of the lady frog (!) then you score double points. I suspect someone at Anirog has a sense of humour and in some ways this adds to the fun of the game.

What exts *Frog Runner* up a notch or two is the care that has been taken with both the presentation and with the graphics. The frogs look like frogs and the cars and lorries on the road are extremely realistic. Another aspect is the clock which instead of being a kind of routine timer is a well-designed digital counter. In fact the whole game looks as though it has been carefully designed prior to release a feature I hope we will be seeing more of.

At £6 this game is a real bargain compared with the previous offering. My only criticism is that with my joystick I found the control a little too sensitive (in other words the frogs moved forward too easily). But I can honestly say this is one of the most addictive games I have ever played.

Next out of the hat was another game from Romik Software (the people who promise to release one new game a month). Some of the games I have seen in the past have been excellent while others have not been up to the mark — this latest offering *Moons of Jupiter* is sadly of the latter variety. It is basically *Asteroids* and is for the expanded Vic (any expansion from 3K upwards).

On cassette as usual it is loaded by the now traditional *Shift/Run Stop* combination. As often happens now I tend to *Load* games in and walk off leaving the tape running. With most games when I return the first 'page' of instructions is waiting for me and I have to press a key to move the program on. With *Moons of Jupiter* though the instructions appeared silently (why not add a blip to attract my attention?) and then proceeded to carry on by themselves. Admittedly nothing of great value is lost if you do go away and return after the program is fully *Loaded* but you would not know that — would you?

The next problem is that the screen looks at you and does nothing once the program is *Loaded*. There is no guidance as to what to do and while hardened players would probably do the same as I did — *Press A Key* (which thankfully works) — I suspect that if this was your first game you might well send it back saying it would not *Load*. A little more care could have avoided that.

In fact the whole presentation is sloppy. Once you *do* get the game going you find yourself on level three. The instructions about how to switch to level one (the easiest level) are not given until you have lost the first game when a different set of instructions appears. I found the game itself hard to play, dull with unexciting graphics (except for the UFOs which did look good) and by the time I started playing the thing I had lost interest because of the careless presentation. Not one of Romik's best.



Next, let's look at a couple of cartridges. The first is *Astroblitz* from Audiogenic which is another of these games where you have to control a spaceship flying over a landscape while trying to avoid enemy missiles. As with most games of this type the aliens are depicted in UFO style ships (an interesting comment on our attitude to



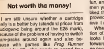
other races perhaps) and they are extremely efficient at firing at you

As with other Audiogenic material, the cartridge is well-packaged with adequate instructions It can only be used with a joystick and runs efficiently I must confess to a dislike of this type of game (probably because I am no good and I find them boring) — but my nine-year-old son seemed to have a whale of a time and actually became quite proficient at it I never seemed able to score anything and had my ship constantly blasted from the sky about once every five seconds It was pretty disheartening



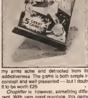
Not worth the money!

I am still unsure whether a cartridge really is a better buy (standard prices from Audiogenic being around the £25 mark), because of the problem of having to switch Ram-packs around again and also because with games like *Frog Runner* around for £6 who needs to spend four times that amount? The best thing about a cartridge is the fact you do not have to sit around wasting for the cassette to *Load*, but hopefully games on discs will start to appear soon making that chore redundant



The other two cartridge games are *Serpentine* and *Choplifter* The first of these is an exhausting game where you are in control of a serpent inside a maze and either chasing, or being chased by enemy serpents (coloured red) To gain strength you need to eat the red serpents (from the rear end only — if you meet them face to face you will be eaten) At various times frogs pop up — if you can eat them before another enemy snake does then you gain strength and length It sounds difficult — but it isn t

However, I found that using the joystick to move my serpent around the maze (especially as he grew in length and became more unwieldy) physically made

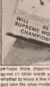


my arms ache and detracted from its addictiveness The game is both simple in concept and well presented — but I doubt it to be worth £25

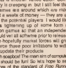
Choplifter is however, something different With very good graphics, this game involves flying a realistic helicopter into enemy territory to pick up several 'soldiers who have been captured then flying them back into your own territory to unload them before you are shot down by enemy tanks This game is both original and extremely enjoyable — the little men who jump up and down to attract your attention as you fly over them were a delight to see

Jet planes and other hazards add to the fun, and a running score of the number of men you have saved is on the screen I liked this game a lot and again with the proviso that being a cartridge it is expensive I can recommend it

What sets *Choplifter* apart is a combination of excellent graphics (the helicopter looks like a helicopter and can be flown forwards, sideways or even backwards) an original idea (no blasting aliens from the sky all the time but quite an original goal of rescuing little men), a degree of skill and,

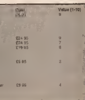


perhaps more important, judgement required (in other words you have to decide whether to leave a few men on the ground and take the ones inside the chopper back to base before a nasty jet zaps the whole lot) With added little touches like the men waving their arms at you, the delightful 'blips' as they board your rescue chopper and the fact you can win, but not too easily and Audiogenic has a winner To me this game is worth the extra money and I will play it again and again if my children will let me



So that is another varied batch Some originality is creeping in but I still feel that a few games are around which are more than just a waste of money — they are an insult to the potential players I would like to see a tightening up of some form of control on games so that an independent body could vet all software prior to release although hopefully market forces will gradually force these poor imitations to withdraw or update their products

Enough soapbox! The main aim of computer software should be fun! So lets hope to see some more of the standard of *Frog Runner* and *Choplifter* in the pipeline ■



Firm	Program	Cost	Value (1-10)
Antirog Computers, 26 Balcombe Gardens, Horley, Surrey	*Frog Runner*	[illegible]	9
Audiogenic, PO Box 88, Reading, Berkshire	*Choplifter**	£24 95	9
	*Serpentine**	£24 95	7
	*Astroblitz**	£19 95	6
Melbourne House, 131 Trafalgar Road, Greenwich, London SE10 5TU	*Games Pack*	£6 95	2
Romik Software, 24 Church Street, Slough SL1 1PT	*Moons of Jupiter*	£9 95	4

*Cartridge





The Black Wizard Velnor has gone into hiding in the Goblin Labyrinth of Mt Elk. The reason is now plainly clear after centuries of searching he has finally discovered the ancient tomb of Grako and is now about to realise his ghastly ambition to become a true demon on earth! Time is too short to mass an Army against Velnor. There is only one hope for mankind. That the brave adventurer may be able to penetrate Velnor's defences, defeating his guards, avoiding the traps and surprising Velnor before the metamorphosis is complete. You are that chosen person but beware not only does Velnor employ the most ghastly of creatures as guards he is now a master of illusion.

In this D & D style adventure you may be a Wizard, Warrior or Priest as a Warrior you are hardened to battle but how will you cope with the fiendish spells of Velnor? As a Wizard your spells are devastating but beware your magic is limited and around mindset doesn't come easy! As a Priest you may protect yourself with the devine powers and you have no fear of the undead but how will you handle the ghastly Trolls?

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CENTIPEDE is a full colour machine code arcade game where the object is to defend yourself with your Laser against a and moving centipede which weaves in and out of the mushroom patch. There are other versions of this game but we think you'll prefer ours because we always strive for an extra dimension of realism, which makes all the difference!
PAINTER is another well loved Arcade game. Here you think paint in between the numbers on a multicoloured screen before you have to overlap. Price for the Spectrum is £5.00

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GORFIAN INVADERS A superb four screen machine code program with Invaders, Galaxians, Firebird and Flagship. Multicoloured Hi-Resolution graphics and Sound Effects. For the 48K Spectrum, price £5.00



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DRAGON

FIGHTER PILOT/ CITY BOMBER

FIGHTER PILOT is an ingenious program for the Dragon 32. It begins with a briefing session giving details of the fire attack waves and shows you pictures of the aircraft which include Messerschmidt and Junkers. You have to get the aeroplanes within your sights and shoot them down. There are five different screens including a parachuting sequence. It makes full use of Hi-Res graphics, colour and sound.
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Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published.

Numbers

on Spectrum

This is a game that I first saw on the watch of one of my friends. Having played it a few times I realised it would be quite easy to convert to a micro, in this case my Spectrum.

A row of numbers will advance resolutely from the left to the right end of a box. You must match the number in the box then fire to remove that number from the box. Should the numbers reach the right-hand end you will lose a life. You get three lives per level.

Program notes

The Graphics in line 1025 is Graphics 'A' and that in line 2005 is Graphics 'B'.

The subroutine at lines 20-50 is the keyboard scan using IN statements. From line 100-292 is the main playing loop. That from 1000-1999 is the firing subroutine. From 2000-2999 is for the game end and the subroutine from 3000-3999 changes the number in the order. From 5000-5999 the numbers are added into the box. Lines 6000-6020 are the holding routine, lines 7000-7050 are the instructions and 9000-9120 are variables and user defined graphics.

Variables

hsc	Highscore
sc	Score
a	Value of your number
life	Lives left
sheet	Sheets
ps	Pause shot
num	Number shot so far
level	Level

```
   1 LET hsc=0000
   2 GO SUB 7000: GO TO 100
  20 REM keyboard scan
  30 IF IN 57342<255 OR IN 61438
<255 THEN GO SUB 1000: RETURN
  40 IF IN 63486<255 OR IN 64510
<255 THEN GO SUB 3000
  50 RETURN
 100 GO SUB 9000: REM variables
 105 CLS : BORDER 5: INK 0: PAPE
R 7: FLASH 0: OVER 0: INVERSE 0:
 BRIGHT 0: BEEP 1,0
 110 REM SCREEN
 115 PRINT AT 2,0;"444"
 120 PLOT 62,81: DRAW 82,0: DRAW
 0,-12: DRAW -82,0: DRAW 0,12
 130 CIRCLE 187,70,10
 140 PRINT AT 12,23;z$
 164 LET k=5: LET ki=1
 165 FOR f=0 TO 31: PRINT AT k,f
; INK ki;"■": NEXT f: LET k=k+1+
(k=5): LET ki=ki+(k=8)-(k=8): IF
 k<10 THEN GO TO 165
 166 PRINT AT 7,0; INK 2;"
NUMBER SHOOT-OUT"
 167 INK 1: PRINT AT 15,0;[redacted]
 170 INK 2: PRINT AT 16,0;[redacted]
 ;AT 17,0;"© WILLIAM WEBB
1983": INK 0
 180 PRINT AT 10,0; INK 0;a$(1 T
O 10),AT 0,12; PAPER 0; INK 7; B
RIGHT 1;"SCORE ";sc; INK 0; PAPE
R 7; BRIGHT 1;AT 0,24;"LEVEL ";l
evel;AT 0,0;"HIGH ";hsc
 200 PRINT INK 0: GO SUB 10: LET
 b=INT (RND*11)
 205 LET count=count+1: IF count
/ps<>INT (count/ps) THEN GO TO 2
20
 210 GO SUB 5000
 220 PRINT AT 10,0; INK 0;a$(1 T
O 10);AT 0,12; PAPER 0; INK 7; B
RIGHT 1;"SCORE ";sc; INK 0; PAPE
R 7; BRIGHT 1;AT 0,24;"LEVEL ";l
evel
 230 INK 0
 260 IF a$(10)<>CHR$ 128 THEN BE
EP .2,0: BEEP .2,10: BEEP .2,0:
GO SUB 2000: REM end routine
 280 IF ps<2.1 THEN GO SUB 10: P
AUSE 40
 300 IF INKEY$="h" THEN GO SUB 6
000
 390 GO TO 200
1000 REM fire
1005 LET ch=0
1006 LET ch=ch+1
1008 IF ch>10 THEN RETURN
1010 IF a$(ch)=CHR$ 128 THEN GO
TO 1006
1020 IF a$(ch)=z$ THEN FOR g=ch
TO 9: LET a$(g)=a$(g+1): NEXT g:
 GO TO 1025
1021 LET ch=ch+1: GO TO 1009
1025 IF z$="A" THEN LET sc=sc+IN
T (RND*25)+10: GO TO 1029
1026 IF z$="0" THEN LET sc=sc+10
: GO TO 1029
1027 LET sc=sc+VAL z$
1029 BEEP .2,24: BEEP .2,12: BEE
P .2,24
1040 RETURN
1999 STOP
2000 REM end
2005 FOR f=0 TO (life-2): PRINT
AT 2,0+f;"A": NEXT f
2006 IF life=1 THEN FOR f=20 TO
-20 STEP -3: BEEP .15,f: NEXT f
2008 IF life=1 AND sc>hsc THEN L
ET hsc=sc: PRINT AT 17,9; INK 2;
 FLASH 1;"HIGH SCORE"
2010 LET life=life-1: IF life=0
THEN INPUT "ANOTHER GO? (y/n)";d
$
2011 IF life>0 THEN GO TO 2020
2012 IF sc>hsc THEN LET hsc=sc:
PRINT AT 10,0; INK 2; FLASH 1;"H
IGH SCORE"
2015 IF d$="y" OR d$="Y" THEN BE
EP .2,00: LET level=1: LET ps=10
: LET life=3: LET sc=0: FOR f=1
TO 10: LET a$(f)=CHR$ 128: NEXT
f: LET num=1: GO TO 105
2020 IF life>0 THEN FOR g=1 TO 1
0: LET a$(g)=CHR$ 128: NEXT g: L
ET num=num-0: RETURN
2999 STOP
3000 LET a=a+1: LET z$=CHR$ (a+4
8): IF a=10 THEN LET z$=CHR$ 144
: LET a=-1
3010 PRINT AT 12,23;z$
3099 RETURN
5000 REM string add
5005 LET num=num+1: IF num>10 TH
EN LET b=00
5010 FOR n=9 TO 1 STEP -1: LET a
$(n+1)=a$(n): NEXT n
5020 LET a$(1)=CHR$ (b+48): IF b
=10 THEN LET a$(1)=CHR$ 144
5025 BEEP .01,0
5030 IF num>15 THEN GO TO 5032
5031 RETURN
5032 FOR e=1 TO 10: IF CODE a$(e
)<>128 THEN RETURN
5033 NEXT e
5050 LET sc=INT (sc*1.8): LET li
fe=3: PRINT AT 2,0;"444": LET nu
m=1: LET level=level+1: LET ps=p
s-(1-(ps=1)): BEEP .2,20: BEEP .
2,30: BEEP .2,20: BEEP .2,10: BE
EP .2,30
5999 RETURN
6000 PRINT AT 2,12; FLASH 1; INK
 2;"IN HOLD"
6010 IF INKEY$="s" THEN PRINT AT
 2,12;"       ": RETURN
6020 GO TO 6010
7000 CLS : REM instructions
7005 FOR f=40 TO 0 STEP -2.8: BE
EP .1,f: NEXT f
7006 INK 0
7010 PRINT "  NUMBER SHOOT-OUT BY
 WILLIAM WEBB[redacted]
7020 PRINT
7030 PRINT '' "The object of thi
s game is to  blast the numbers
before they   get to the right h
and end"''"Use keys 1-5 and 0-
T to change your number  " Use
keys 6-0 and Y-P to blast"
7032 PRINT '' "  h"" to hold the
game    "s"  to restart"
7038 PAUSE 200
7040 PRINT AT 19,2; FLASH 1;"Any
 key to start": PAUSE 0
7050 CLS : RETURN
9000 LET a=0: LET life=3: LET sh
eet=1: LET sc=0
9010 RESTORE : FOR f=0 TO 7: REA
D c: POKE USR "A"+f,c: NEXT f
9011 FOR f=0 TO 7: READ c: POKE
USR "B"+f,c: NEXT f
9020 DATA BIN 00111100,BIN 01111
110,BIN 01011010,BIN 01111110,BI
N 00111100,BIN 01100110,BIN 0100
0010,0
9021 DATA 0,BIN 00001000,BIN 000
11000,BIN 00111000,BIN 01111000,
BIN 00001000,BIN 00001000,BIN 00
001000
9030 LET z$="0": DIM a$(10): FOR
 f=1 TO 10: LET a$(f)=CHR$ 128:
NEXT f: DIM b$(10)
9040 LET ps=10: LET num=1: LET l
evel=1: LET sc=0: LET count=1
9050 LET O=000531.37
9100 RETURN
```

Numbers
by William Webb

OPEN FORUM

Balloons

on Spectrum

The idea of the game is to burst as many balloons as you can within the allotted time (which is random).

To burst a balloon you have to jump off the cart, burst the balloon and then return to the cart before trying to burst another balloon.

If you miss the cart then the game finishes and you can play again or you can load the next program on your tape.

If you miss or try to cheat, you will be told.

Program notes

Variables used in this program are

a, b Co-ordinates of man
f Co-ordinates of cart
k Level of difficulty
l Length of game
m Movement of cart
s Score
n Stops instructions from being repeated
q Co-ordinates of balloon
v Colour of balloon
t Indicator of the depression of the P key
a$ Graphic A
b$ Graphic B
c$ Graphic C
d$ Graphic D
e$ Graphic E F G
g$ Graphic H
i$ Graphic I
j$ Graphic J
u$ and w$ Type of man being printed (rising or not)

Instructions are included in the program.
To save the program Save JUMPER Line 1 this will run the program automatically once loaded.

```
  10 REM ********JUMPER**********
  20 REM ****by Iain Souter*****
  30 REM ************************
  40 RESTORE : PAPER 0: BORDER 0
: CLS
  50 LET n=0: POKE 23609,0: GO S
UB 7000
 100 GO TO 8500
 200 GO TO 400
 300 GO TO 9300
 400 LET a$="A": LET b$="B": LET
c$="C": LET d$="D"
 500 LET e$="E": LET h$="F": L
ET i$="I": LET j$="J"
 600 LET f=20: LET a=15: LET b=1
7
 700 PAPER 0: INK 9: BORDER 1: C
LS
 800 LET m=1: LET q=5
 900 LET l=0: LET s=0: LET y=0
1000 LET k=1: LET c=3: LET d=5
1100 LET u$=c$: LET w$=d$
1200 PRINT AT c,d;" ";AT c+1,d;
 AT c-1,d
1300 IF RND<.1 THEN LET q=INT (R
ND*31)
1400 LET v=INT (RND*7): IF v=5 T
HEN LET v=2
1500 PRINT INK v;AT 0,q;h$
1600 IF l>=INT (100*RND)+182 THE
N GO TO 6000
1700 LET l=l+1: LET t=0
1800 IF INKEY$="P" THEN LET a=a-
k: LET u$=a$: LET t=1: LET w$=b$
1900 IF INKEY$="C" THEN LET b=b+
1
2000 IF INKEY$="Z" THEN LET b=b-
1
2100 LET a=a+1
2200 IF SCREEN$ (a+1,b)<>" " AND
 a>=19 THEN LET a=19: LET b=b+m:
 LET y=1
2300 IF SCREEN$ (a+1,b)=" " AND
a>=20 THEN GO TO 4000
2400 LET f=f+m: IF f>=29 OR f<=0
 THEN LET m=-m
2500 PRINT AT 21,f;
2600 IF SCREEN$ (a-1,b)<>" " AND
 y=1 THEN GO SUB 5000: LET y=0:
GO TO 3000
2700 IF SCREEN$ (a-1,b)=" " AND
y=0 AND a<=1 THEN GO SUB 5500: L
ET y=2: GO TO 3000
2800 IF SCREEN$ (a-1,b)=" " AND
a<=1 THEN GO SUB 4500: LET y=2
3000 IF a>=20 THEN LET a=20
3100 IF a<=1 THEN LET a=1
3200 IF b<=0 THEN LET b=0
3300 IF b>=31 THEN LET b=31
3400 IF t=1 THEN PRINT INK 0;AT
a-1,b;i$
3500 PRINT AT a,b;u$;AT a+1,b;w$
;AT 21,f;e$
3600 BEEP .005,60
3700 GO TO 1000
4000 PRINT AT 11,11;"You missed!
"
4100 PRINT INK 0;AT a+1,b;j$
4200 PRINT AT 21,f;e$
4300 BEEP 2,-25
4400 GO TO 6200
4500 PRINT AT 11,11;"You missed!
"
4600 PRINT AT 1,b;a$;AT 2,b;b$;
INK 0;AT 0,b;i$
4700 PRINT AT 21,f;e$
4800 BEEP 2,-25
4900 PRINT AT 11,11;"
": RETURN
5000 PRINT AT 1,b;a$;AT 2,b;b$;
INK 0;AT 0,b;i$
5100 PRINT AT 21,f;e$
5200 LET s=s+1: FOR i=-30 TO -20
: BEEP .1,i: NEXT i
5300 FOR i=1 TO 10: BEEP .01,i:
BORDER RND*7: FLASH 1: NEXT i: F
LASH 0: BORDER 1
5400 RETURN
5500 PRINT AT 1,b;a$;AT 2,b;b$;
INK 0;AT 0,b;i$: INK 0;AT 21,f;e
$
5600 PRINT AT 11,11;"DON'T CHEAT
!"
5700 FOR i=0 TO -20 STEP -1: BEE
P .01,i: NEXT i
5800 PRINT AT 11,11;"
"
5900 RETURN
6000 CLS : PRINT AT 3,11;"HARD L
UCK!";AT 5,5;"You ran out of tim
e."
6100 GO TO 6300
6200 CLS : PRINT AT 3,11;"HARD L
UCK!"
6300 PRINT AT 10,7;"Your SCORE w
as ";s
6400 PRINT ''TAB 3;"Do you want
to try again?"
6500 PRINT ''TAB 6;"PRESS ""Y""
OR ""N"""
6600 IF INKEY$="" THEN GO TO 660
0
6700 IF INKEY$="Y" THEN GO TO 93
00
6800 IF INKEY$="N" THEN CLS : PR
INT FLASH 1;AT 11,11;"[illegible]":
 LOAD ""
6900 GO TO 6600
7000 FOR p=144 TO 153: FOR r=0 T
O 7: READ s: POKE USR CHR$ p+r,s
: NEXT r: NEXT p
7100 DATA 90,153,189,153,153,255
,60,60
7200 DATA 60,60,60,36,36,60,36,1
02
7300 DATA 24,24,60,24,24,255,189
,189
7400 DATA 189,189,189,36,36,36,3
6,102
7500 DATA 255,16,2,7,0,16,8,7
7600 DATA 255,255,126,129,129,12
9,129,0
7700 DATA 255,240,64,224,16,80,1
6,224
7800 DATA 60,60,36,24,60,126,60,
24
7900 DATA 8,8,8,8,8,20,34,65
8000 DATA 64,232,115,48,121,58,1
24,255
8100 RETURN
8500 INK 6: PRINT TAB 13;"JUMPER
": FOR i=1 TO 60: BEEP .01,i: NE
XT i
8600 CLS : PRINT FLASH 1; PAPER
6; INK 6;AT 11,10;"[illegible]":
 PAUSE 100
8700 CLS : PRINT AT 0,13;"[illegible]
"
8800 PRINT '"  To play JUMPER y
ou must burst the balloons by ju
mping off the cart up to the bal
loons at the top of the screen."
8900 PRINT '"  After bursting a b
alloon you must land on the car
t again, before you try to bu
rst another balloon."
9000 PRINT '"  PRESS key ""P""
 to JUMP.       PRESS key ""Z
"" to move LEFT.   PRESS key "
"C"" to move RIGHT."
9100 PRINT '"  Press any key to
 continue"
9200 IF INKEY$="" THEN GO TO 920
0
9300 CLS : PRINT AT 10,7;"Enter
level of";TAB 7;"difficulty A,B
or C.";TAB 7;"A is the easiest."
: INPUT r$
9400 IF r$<CHR$ 65 OR r$>CHR$ 67
 THEN GO TO 9300
9500 IF r$="A" THEN LET k=7
9600 IF r$="B" THEN LET k=3
9700 IF r$="C" THEN LET k=2
9800 CLS : PRINT AT 10,11;"GOOD
LUCK": PAUSE 60: IF n=1 THEN GO
TO 400
9850 CLS : PRINT AT 0,0;"  Oh I
forgot to tell you don't let go
of the ""P"" key or you will
have to return to the cart."
9900 PRINT '''  There is also a
random limit to the number of t
imes the cart can change directi
on.''',"SO HURRY!": PAUSE 600:
LET n=1
9980 GO TO 400
9990 SAVE "JUMPER" LINE 10: VERI
FY
```

Balloons
by Iain Souter

Dice

on Vic20

Dice allows you to convert your expensive Vic into a cheap set of six-sided dice! To do this the program uses data to obtain the correct dot positions and then individually prints up the dice

From one to four can be chosen, and there are error traps on invalid inputs where appropriate, allowing the program to be used by computer novices Sound and colour add to the appeal of this concise version

```
10 DIMP(35) POKE36879,0 POKE36878,15
20 FORI=0TO35 READP(I) NEXTI
30 PRINT"▮▮     ***▮DICE▮***"
40 INPUT"▮▮ HOW MANY DICE(1-4)",D
50 IFD<1ORD>4ORD-INT(D)>0THENPRINT"▮INVALID INPUT▮" GOTO40
60 FORI=1TOD R(I)=INT(RND(1)*6) NEXTI PRINT"▮";
70 FORD=1TOD T=D*5-5 PRINTTAB(T)"┌──┐" FORI=0TO5
72 POKE36876,160+I*2+D*10
75 POKE7697+P(R(D)*6+I)+D*5+22*INT(I/2),81
78 IFI/2-INT(I/2)>0THENPRINTTAB(T)"|▮▮▮|"
80 NEXTI PRINTTAB(T)"└──┘", NEXTD PRINT"▮▮▮▮" POKE36876,0
90 INPUT"▮DICE AGAIN",S$
100 IFS$="Y"THEN40
110 IFS$<>"N"THENPRINT"▮INVALID INPUT▮" GOTO90
120 PRINT"▮GOODBYE THEN" POKE36879,27
200 DATA0,0,0,2,0,0,1,0,0,0,0,3,1,0,0,2,0,3,1,3,0,0,1,3,1,3,0,2,1,3,1,3,1,3,1,3
```

Dice
by Maur Gifford

Graphics

on Dragon

The program, when run, displays the instructions one by one to avoid confusion

It requires four separate inputs The first is the same as the actual sub-command The second is the radius of the design, measured in pixels The third is the distance (again in pixels) between each of the circles The fourth sets the colour of the design

When the design has been drawn (it may take some time for the complex ones) you may either press *A* to see it drawn again, *C* to display the variables first keyed in, or *Clear* to start again

```
10 REM CIRCLE PATTERN DESIGNER
20 REM J SPOWART (27 2 83)
30 REM
40 CLS
50 PRINT@38 "CIRCLE PATTERN DESIGNER
60 PRINT@167 "HEIGHT WIDTH RATIO
70 INPUT B
80 PRINT@234 "HOW LARGE
90 INPUT C
100 PRINT@297, "WHAT SPACING"
110 INPUT D
120 PRINT@360 "WHITE OR GREEN
130 PRINT@365 "(1 or 0)
140 INPUT E
150 REM ACTUAL DRAW
160 PMODE 4 1 SCREEN 1 E PCLS
170 FOR A = 0 TO C STEP D
180 CIRCLE(128 96),A,1 B
190 NEXT A
200 A$ = INKEY$
210 IF A$ = CHR$(12) THEN 40
220 IF A$ = "A" THEN 170
230 IF A$ = "C" THEN 250
240 GOTO 200
250 CLS
260 PRINT "H/W = ";B" SIZE = ";C
270 PRINT PRINT "SPACING = ";D "COLOUR =
    ";E
280 GOTO 200
290 REM
```

Graphics
by Jonathon Spowatt

Trapper

on BBC Micro

This is loosely based on the light-cycle game in TRON Two players battle it out in the games arena Each player's cycle is controlled by just two keys (no scrambling madly on the wrong keys here)

The yellow player on the right uses the ' and ' keys

The white player on the left uses the 'Z' and 'X' keys

These change the angle at which the bike moves by 10 degrees

The 'Z and ' decrease the angle turning you anti-clockwise

The 'X and ' increase the angle, turning you clockwise

You have one chance of going through a light wall this is by hitting it at an angle of about 90° to it Beware — this will not always work! You die if you hit your trail your opponents trail, or if you go out of the red screen boundary

The program is well structured, enabling typing errors to be quickly tracked down

Variables

SPD — Game speed
SC1 — Player one's score
SC2 — Player two's score
X Y — Player one's co-ords
C D — Player two's co-ords
XY — Player one's angle
CD — Player two's angle
r1 r2 — win flags

SPD increases every go and you may have to re-start the program if it becomes too difficult

```
10 MODE 7
20 PROC rules
30 MODE 1
40 SC1=0
50 SC2=0
60 SPD=5
70
80 X=300 Y=300
90 XY=RND(36)*10
100
110 C=900 D=900
120 CD=RND(36)*10
130
140 XY1=-98 XY2=-67
150
160 CD1=-103 CD2=-104
170
180 GCOL0 1 MOVE 0 0 DRAW 1279 0 DRAW
    1279 1023 DRAW 0 1023 DRAW 0 0
190
200 REPEAT
210 PROC move 1
220
230 PROC move 2
240
250 UNTIL r1=TRUE OR r2=TRUE
260 PROC congrats
270 SPD=SPD+1
280 MODE 7
290 PROC scores
300 PROC again
310 MODE 1
320 IF REPLY=FALSE THEN 60
330
340 MODE 7
350 PRINT CHR$131 "GOOD-BYE
360
370 END
380
390 *************************************
400 DEF PROC move 1
420
430 MOVE X,Y
440 IF INKEY (XY1) THEN XY=XY-10
450 IF INKEY (XY2) THEN XY=XY+10
460
470 IF XY=-10 THEN XY=350
480 IF XY=370 THEN XY=10
490
500 X=X+(SINRADXY)*SPD
510 Y=Y+(COSRADXY)*SPD
```

Continued on page 19



ANIROG
VIC20

```
530
538 IF POINT (X Y)<>0 THEN r1=TRUE ENDPROC
540 GCOL 0 3 DRAW X,Y
550 r1=FALSE
560 END PROC
570 ****************************************
580 DEF PROC move 2
590
600 MOVE CnD
610 IF INKEY (CD1) THEN CD=CD-10
620 IF INKEY (CD2) THEN CD=CD+10
630
640 IF CD=-10 THEN CD=350
650 IF CD=370 THEN CD=10
660
670 C=C+(SINRADCD)*SPD
680 D=D+(COSRADCD)*SPD
690
700 IF POINT (C D)<>0 THEN r2=TRUE ENDPROC
710 GCOL 0,2 DRAW C D
720 r2=FALSE
730 ENDPROC
740 ****************************************
750 DEF PROC congrats
760 IF r2 THEN COLOUR 3 PRINT TAB(15 4) White wins
770 IF r1THEN COLOUR 2 PRINT TAB(14 8) ' Yellow wins
780
790 ENVELOPE 1,2,1 4 8 10 8 5 10 -2 -1 -1 12-0 80
800 SOUND 1 1 100 30
810 SOUND 0 -10 7 25
820 TIME=0 REPEAT UNTIL TIME>800
830 ENDPROC
840 ****************************************
850 DEF PROC scores
860 PRINT CHR$136 CHR$157 CHR$135
    CHR$136 SPC8 SCORES TABLE
870 IF r2 THEN SC1=SC1+1 ELSE SC2=SC2+1
880 PRINT SPC4, Games played TAB(29) CHR$132 CHR$157 CHR$135 STR$(SC1+SC2) CHR$156
890 PRINT SPC4 White victories TAB (29) CHR$132, CHR157 CHR$135 STR$(SC1) , CHR$156
900 PRINT SPC4 Yellow victories TAB(29) CHR$132 CHR$157 CHR$135 STR$(SC2) CHR$156
910
920 IF SC1>=SC2 THEN 960
930 PRINT SPC9 CHR$129 CHR$157 CHR$131 CHR$141 Yellow Leads CHR$156 SPC9 CHR$129 CHR$157 CHR$131 CHR$141, Yellow Leads CHR$136
940 GOTO 1010
950
960 IF SC1=SC2 THEN 1000
970 PRINT SPC9 CHR$130 CHR$157 CHR$135 CHR$141 White Leads CHR$156 SPC9 CHR$130 CHR$157 CHR$135 CHR$141 White Leads CHR$136
980 GOTO 1010
990
1000 PRINT SPC16 CHR$130 CHR$157 CHR$135 CHR$141 DRAW CHR$156 SPC16 CHR$130 CHR$157 CHR$131 CHR$141 "DRAW " CHR$136
1010 ENDPROC
1020 ****************************************
1030 DEF PROC again
1040 PRINT SPC8 CHR$130 PRESS E TO END"
1050 PRINT SPC8 CHR$131 "Any other key to start
1060 PROC mug-trap
1070 d$=GET$
1080 If d$= E OR d$= e THEN REPLY=TRUE ENDPROC
1090 REPLY=FALSE
1100 ****************************************
1110 DEFPROC mug-trap
1130 *FX15 0
1140 REPEAT
1150 UNTIL INKEY(20)=-1
1160 ENDPROC
1170 ****************************************
1180 DEF PROC rules
1190 PRINT
1200 FOR-1 TO 2
1210 PRINT CHR$141 CHR$(130+I) "TRAPPER"
1220 NEXT
1230 PRINT' CHR$131 "The Yellow Player uses the keys
1240 PRINT CHR$131 < and > to change his angle"
1250 PRINT CHR$131 " of movement
1260 PRINT The White Player uses the "
1270 PRINT Z' and X keys." Surround your opponents to win "
1280 PRINT' CHR$134 The game will get faster every go
1290 PRINT 'SPC11,, VDU 141 132 157 135 136 PRINT GOOD-LUCK " CHR$136
1300 PRINT SPC11 VDU 141 132 157 135,136 PRINT GOOD-LUCK" CHR$136
1310 PROC mug-trap
1320 D=GET
1330 ENDPROC
1340 ****************************************
```

Trapper
by D Golds

Houdini Hamster

on Spectrum

In this game for the 16K Spectrum you must guide HH from his cage to the cheese. Blocking him are impassable fences. When you have mastered this try guiding him from his cage to the cheese to his cage again and then back to the cheese.

Program notes

Lines	
1 to 190	Instructions and variables
200 to 290	Move player routine
3000 to 3050	Quit routine
9000 to 9070	U D G

```
1 REM Houdini Hamster
2 REM
3 REM © Andrew Viner (12) 10-1-83
4 REM
10 FOR i=144 TO 152: FOR n=0 TO 7: READ a: POKE USR CHR$ i+n,a: NEXT n: NEXT i
20 BORDER 0: PAPER 0: INK 0: CLS
25 PRINT : PRINT
26 GO SUB 30
27 GO TO 40
30 FOR n=0 TO 2: PRINT TAB 6,"    ": NEXT n
35 RETURN
40 FOR n=0 TO 1: PRINT TAB 6,"    ": NEXT n
50 GO SUB 30
60 PRINT AT 0,14,"  ";AT 9,14,"  "
70 PRINT AT 0,20,"  ";AT 0,20
80 PRINT AT 9,0,"HOUDINI HAMSTER"
90 PRINT AT 10,0;"You must guide Houdini Hamster ( ) from his cage (", INK 6; " ", INK 6;"I
K 2,"  " INK 6; ) to some cheese ( ) avoiding the fences ( ", INK 5; " ", INK 5;")
100 PRINT : PRINT FLASH 1; "Press any key": PAUSE 0: CLS
110 PRINT TAB 10; PAPER 6; INK 2; CONTROLS
120 PRINT : PRINT : PRINT TAB 20;"Quit"
130 PRINT "5", PRINT TAB 20; "Up"
140 PRINT "X", PRINT TAB 20; "Down"
150 PRINT "Z", PRINT TAB 20; "Left"
160 PRINT "C", PRINT TAB 20;"Right"
170 PRINT : PRINT FLASH 1;"Press any key": PAUSE 0: CLS
180 LET a$=" "
190 LET x=0: LET y=0
200 PRINT AT 0,0; INK 2;" ";AT 1,0; INK 2;" "
210 PRINT AT 21,31;" "
220 PRINT AT x,y; INK 6;
230 IF INKEY$="x" THEN IF ATTR (x+1,y)<>5 THEN IF ATTR (x+1,y+1)<>5 THEN IF x<21 THEN LET x=x+1
240 IF INKEY$="s" THEN IF ATTR (x-1,y)<>5 THEN IF ATTR (x-1,y+1)<>5 THEN IF x>0 THEN LET x=x-1
250 IF INKEY$="c" THEN IF ATTR (x,y+2)<>5 THEN IF y<30 THEN LET y=y+1: LET a$=" "
260 IF INKEY$="z" THEN IF ATTR (x,y-1)<>5 THEN IF y>0 THEN LET y=y-1: LET a$=" "
265 IF INKEY$="q" THEN GO TO 3000
266 IF x=21 AND y=30 THEN GO TO 4000
267 PRINT AT 21,30;" "
270 PRINT AT x,y; INK 6;a$
275 PRINT AT INT (RND*22), (INT (RND*32)); INK 5;" "
280 GO TO 200
3000 PRINT AT 21,0;"Hard luck!"
3001 PRINT AT x,y; INK 6;a$
3005 FOR n=20 TO -10 STEP -1: BEEP .01,n: BEEP .01,n-2: BORDER RND*7: NEXT n
3010 BORDER 0: INPUT "Another go (Y/N) ? ";f$
3020 IF LEN f$<1 THEN GO TO 3010
3030 IF f$(1)="y" OR f$(1)="Y" THEN RUN
3040 IF f$(1)="n" OR f$(1)="N" THEN STOP
3050 GO TO 3010
4000 PAUSE 100: CLS
4010 FOR n=0 TO 7: PRINT "  ";: NEXT n
4020 PRINT : PRINT "Well done!": FOR n=0 TO 40: BEEP .01,n: BEEP .01,n+2: BORDER RND*7: NEXT n
4030 GO TO 3010
9000 DATA 32,BIN 01111111,BIN 10111111,BIN 01111111,BIN 00011001,BIN 00101010,0,0,0,100,BIN 11100000,BIN 11000000,100,120,0,0
9010 DATA 0,1,7,3,1,1,0,0,0,254,253,254,BIN 10011000,BIN 01010100,0,0
9020 DATA 255,BIN 10010101,255,BIN 10010101,255,BIN 10010101,255,BIN 10010101
9030 DATA 255,BIN 01010101,255,BIN 01010101,255,BIN 01010101
9040 DATA 255,BIN 10010101,255,BIN 10010101,255,BIN 10010101,BIN 10010101,255
9050 DATA 255,BIN 01010101,255,BIN 01010101,255,BIN 01010101,BIN 01010101,255
9060 DATA 0,BIN 00111100,BIN 01111110,BIN 01111110,BIN 01111110,BIN 00111100,0
9070 DATA 0,1,0,7,0,BIN 00111111,BIN 01011101,BIN 01110111,255
```

Houdini Hamster
by Andrew Viner

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Bar Graph

on Vic20

This program for the unexpanded Vic20 enables you to display your data in the form of a bar graph. The screen display is calculated according to the scale. The scale must be from 0 to a number bigger than 1.

After typing in the data and selecting the colours the screen will go blank for a few seconds. This is because the columns of the graph are being poked into screen memory and it is only after this has been done that the colour is added.

Variables used

- A% Uses to see whether or not you want instructions and later to hold the title string
- B$ Used to delay the program until you hit a key
- S% Height of scale
- CN Number of columns.
- D Used to control the loop to enter the figures and to control the loop to draw columns on screen and again to display figures after displaying the graph
- U Number of first colour chosen
- E Number of second colour chosen
- K Used to control loop to draw horizontal axes.
- S Used to control loop to draw vertical axes
- J Used to control loop to draw individual columns
- K Screen code for a reversed space
- T Used to control loop to add first colour chosen to alternate columns on screen.
- C As T but does second colour and remaining columns
- S1% S2% S3% Used to find fractions of S% to put on scale
- J$ See B$
- Z$ Used to choose option from menu
- V$ Used to decide whether or not to change figures and again to decide whether or not to display graph again
- W$ Used to decide whether or not to change colours

Arrays used

- D% Used to store the heights of the columns after they have been scaled
- DK% Used to store the heights of the columns as they are typed in so they can be displayed later

Program notes

Lines	
10 to 32	Title screen
34	Checks whether or not you want instructions
40 to 65	Instructions
90	Clears screen and changes to upper case
150 to 170	Pokes horizontal axes into screen memory
180 to 210	Pokes vertical axes into screen memory
250 to 310	The most important bit. Uses two loops one to control the starting point of the column and the other to poke a reversed space from there to the finishing point of the column in a vertical line.
330 to 350	Gets you to move the program on
360	Goes to menu for options
420 to 450	Prints figures in the columns on screen
460 to 474	Asks you whether you want to change figures and takes appropriate action
476	Sends you back to input new figures
500	Set up arrays for the figures you type in and for the figures after they have been calculated
505 to 507	Asks you for title and checks its length
510 to 540	Asks you for number of columns and their heights
550 to 560	Pokes first colour onto alternate columns of graph
570 to 580	Pokes second colour onto other columns
582 to 598	Adds scale along left-hand side of screen
610 to 630	Asks whether you want graph displayed again after displaying figures and takes appropriate action
640	Sends you to main menu
650 to 690	Asks you if you want to change colours and takes appropriate action
710 to 760	Asks you which colours you want for the graph
800 to 870	Main menu
880 to 890	Goes to correct section following your selection
900	Calculates variables for scale

To those of you with Vic printers

By changing two lines and inserting a few more you can have the option of having a crisp clean copy of your graph on paper. All you have to do is

Change line 600 to Goto 315

Change the 5 in line 870 to 6

Insert the following lines

```
286 ifz$< 5 orz$ > 5 then288
287 ifd/2 int(d/2)thenk = 182
315 ifz$ = 5 thengosub6010
860 Print    Printout graph on printer"
630 ifz$ = 6 then1000
999 rem****printer check
1000 Poke36879 26 print         Make sure the
     printer is turned on, and that there is paper
1010 Print in it
1020 Print       Press Return when you are
     ready
1030 inputz$ goto150
6000 rem****screencopy
6010 r$ = chr$(145):v$  chr$(146):open4 4 7:print
     # 4:g = peek(648) * 256:print # 4 r$:forp =
     gtog + 505
60020 c = peek(p):c$ =   if(p - g)/22 = int((p
     g)/22)then print # 4 chr$(8) + chr$(13) +
     chr$(15)
60030 ifc > 128thenc = c - 128:c$ = chr$(18)
60040 ifc < 32orc > 95thenc = c + 64 goto60060
60050 ifc > 63andc < 96thenc = c + 128
60060 c$ = c$ + chr$(c):iflen(c$) > 1thenc$ = c$ +
     v$ + r$
60070 Print # 4 chr$(14)c$ next print #
     4:close4 return
```

PROGRAM OF THE WEEK

```
1 rem***graph
3 rem***ensure lower case mode when typing in
4 rem***leave out rem statements if not required
9 rem***first bits and instructions
10 print"█" Poke36879,25 Print"█"chr$(14)
15 Print"████████████████████████"
20 Print"██████ █GRAPHS█ ███████"
22 Print"████████████████████████"
25 Print"███(C)Michael Clarke 1983
30 Print"██Instructions ██Y██ or ██N██"
32 getas ifa$=""then32
34 ifa$="n"then90
40 Print"███Type in up to 19       numbers and the
   computer will display " ,
50 Print"them as a"
55 Print"██████BAR GRAPH"
60 Print"██HIT A KEY TO GO ON"
65 getb$ ifb$=""then65
90 print"█" Printchr$(142)
92 goto500
149 rem**** Poke graph onto screen in white
150 Print"█" Poke8145,76 fork=8130to8145+13
160 Pokek,100
170 nextk
180 x=20*22
190 fors=8123to7683step-22
200 Pokes,101
210 nexts
250 ford=1tocn
280 forj=8144+dto8144+d-((d%(d)-1)*22)+1step-22
285 k=160
286 ifd%(d)=0thenk=32
290 Pokej,k
300 nextj
310 nextd
312 goto550
330 print"██████████████████████████HIT A KEY FOR
    OPTIONS"
340 getJ$
350 ifJ$=""then340
360 goto800
419 rem****display figures
420 Print"█"
430 ford=1tocn
440 Printdk%(d),
450 nextd
455 Print
460 Print"Change figures ██Y███or ██N██"
470 getv$
472 ifv$=""then470
474 ifv$="n"then 610
476 clr goto90
499 rem****input figures and title
500 dimd%(19) dimdk%(19)
505 Printchr$(14) Print"█Title" Print"Up to 15
    Characters"
506 inputa$
507 iflen(a$)>15then505
510 Printchr$(14)"█Scale (from 0 to ?)" inputs%
512 Print"█How many columns(1-19)" inputcn
515 Print"██Input Figures"
520 ford=1tocn
530 inputd%(d) dk%(d)=d%(d)
535 d%(d)=d%(d)*(20/s%)
540 nextd
542 gosub700
545 goto150
549 rem****poke colour onto screen
```

Continued on page 24

```
550 fort=38402to38905step2
560 poket,u
565 nextt
570 forc=38403to38904step2
580 pokec,e
590 nextc
591 gosub950
592 print"[illegible]",a$ print"[illegible]",s% rem###add
    scale and title
594 print"[illegible]",a1%
595 print"[illegible]",a2%
597 print"[illegible]",a3%
598 print"[illegible]"
600 goto330
609 rem###choose options after displaying figures
610 print"Display graph again?  Y or N"
620 getv$ ifv$=""then620
630 ifv$="y"then650
640 goto800
650 print"Same colours?"
660 print"Y or N"
670 getw$ ifw$=""then670
680 ifw$="n"thengosub700
690 goto150
695 rem###choose colour for graph
700 print"" print"What colour do you
    want the graph?"
710 print"Two colours only."
720 print"To select colour hit  adjacent number"
730 print" 0  Black     1  White"
740 print" 2  Red       3  Cyan"
750 print" 4  Purple    5  Green"
760 print" 6  Blue      7  Yellow"
770 input"First Colour",u
775 input"Second Colour",e
780 return
799 rem###choose options
800 print"   What Next?"
810 print"Hit appropriate key to choose."
820 print"1 Display Figures"
830 print"2 Change Figures"
840 print"3 Change Colours"
850 print"4 Display Graph Again"
870 print"0 Quit the Programme"
880 getz$ ifz$=""then880
890 ifz$="1"then420
900 ifz$="2"thenclr goto500
910 ifz$="3"thengosub700 goto150
920 ifz$="4"then150
940 printchr$(142)"bye bye" end
950 a1%=s%*.75 a2%=s%*.5 a3%=s%*.25 return
```

Bar Graph
by Michael Clarke

Clock

on ZX81

The machine code program will simulate a clock.

Careful adjusting of the delay can make it accurate to one tenth of a second

Entering the program

Firstly enter line 1 which will contain any 10 characters. Now enter line 2 which will consist of 132 characters.

Enter the hex loader and type in all the hex codes either individually or in blocks. When finished, if you are correct 0/60 should be at the bottom of the screen. Line 2 should now be as above.

After typing the accompanying basic all should work. Once run the string prompt will appear. Enter the time that the clock should start at in this form.

hours minutes seconds tenth seconds.

Press N/L again to start the clock. Any key pressed thereafter will halt the program with 5/160

To change the delay,

poke 16565 with least significant byte (usually 100)
poke 16566 with most significant byte (usually 13)

```
  1 REM 1234567890
  2 REM 0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
  3 REM [illegible]
 10 LET A$=""
 20 FOR A=16530 TO 16661
 30 IF A$="" THEN INPUT A$
 40 POKE A,16*CODE A$+CODE A$(2)-476
 50 LET A$=A$(3 TO )
 60 NEXT A

ZX81 CLOCK   [illegible]

21  5B  40  3E  25  BE  20  24
34  2A  0C  40  01  32  01  09
11  32  40  E0  01  0A  00  ED
B0  3A  25  40  FE  FF  20  02
CF  04  11  14  0D  10  7A  E7
20  F8  1B  D4  35  1C  C3  CC
92  40  21  29  40  3E  25  BE
28  03  34  18  F2  36  1C  21
86  40  3E  21  BE  20  03  34
18  EB  35  1C  21  3B  40  3E
25  BE  28  03  34  1B  D8  36
1C  21  56  40  3E  21  BE  28
03  34  1B  CB  36  1C  21  03
40  3E  25  BE  20  03  34  1B
BE  36  1C  21  62  40  3E  21
BE  20  03  34  15  B1  18  B1
36  1C  1B  AD
```

```
  1 REM 00 01 00 1
  2 REM 5 RNDY9 CODE £RND" ") R
ND FOR "   GOSUB  U9RND RETURN C
OPY C INT  )?$.?  4 CLS /USR 00TA
N LN  RND5 RNDY9 C 0/ PAUSE 005
RNDY5 C 0/ FAST 005 RNDY9 C 0/**
005 RNDY5 C 0/ACS 005 RNDY9 C 0/
 005 RNDY5 C 0, ,000,
  5 PRINT AT 0,0;"[illegible]"
 10 PRINT AT 6,0;"INPUT TIME",AT 8,8,"HH MM SS T"
 20 INPUT A$
 30 IF LEN A$<>10 THEN GOTO 20
 40 FOR A=1 TO 10
 50 POKE 16513+A,CODE A$(A)
 60 NEXT A
 70 PRINT AT 6,0;"                  "
 75 INPUT A$
 80 RAND USR 16577
```

Clock
by A Kerr

Tony Bridge's Adventure Corner

Help!

It's more than a game It's an institution ' So said Thomas Hughes the novelist He was talking of a quiet sedate game that is nowadays played by Australians wearing pink but he might equally have meant a later 20th-century phenomenon, Adventure

Some of your letters have asked for the basic guidelines to Adventuring on computers so I thought that we should have a rest from looking at all the myriad adventure programs and concentrate instead on the history and theory of the genre The first thing to bear in mind is that this is just about the most frustrating thing that you can do on your computer — I hope so anyway!

Last week I mentioned Tracy Kidder's book *Soul of a New Machine* In addition to being a primer on the computer industry, and an insight into the commercial world of computer design, the book also contains some absorbing inside information on the beginnings of adventure

Imagine a futuristic looking complex of low-rise buildings sometime in the late sixties or early seventies The main purpose of these buildings is the design and manufacture of computers For long long ndure throughout the day young whizzkids slave over hot terminals and huddle together in corners, talking in a language that is largely — to you and me — incomprehensible The conversation is of Nand gates microcode and microverbs, *locs* and *Pals*

Eventually however even these dedicated computer-builders tire — the lights are gradually switched off, until isolated pools are left Long after the rest have gone home one or two *Midnight Programmers* are left staring at the VDUs These are the pioneer adventurers that have bequeathed to us this frustrating pastime

Next week I will delve further into the delights to be found in Adventure

I have received several pleas of *help* in the post Many of the letters concern *The Hobbit* as only befits a game that is certain to become one of the classics for the Spectrum But, a lot of you seem to be stuck on one or another of Artic's programs

Alastair Davie of Bromley and R M Chart of St Mawes (one of my favourite places in England) are both in trouble on the *Planet of Death* while poor old Stephen Perchard usually of Bracknell but now stuck on *Espionage Island* is having terrible trouble there Dosha Haynes of Melton Mowbrey is having problems on the *Ship of Doom*

Well, if it is any consolation you are not alone! Artic's adventures are among the most annoying and frustrating of all those available for the Sinclair machines However Artic tell me that they have *help* sheets available for those who are really stuck Write to Artic at 396 James Reckitt Avenue Hull North Humberside

Incidentally as a more general point, most companies producing adventures have *help* sheets of their own It is certainly worth writing to the relevant company and asking for advice

I will be answering some more of your interesting letters next week, with some specific clues for those who are stuck — in the meantime *let sleeping Uruk-hais be!* ■

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge Adventure Corner, *Popular Computing Weekly* Hobhouse Court 19 Whitcomb Street London WC2 7HF

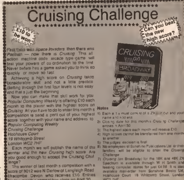
Comedy
on ZX81

What's this? An original program for the ZX81? Impossible? NO! The following program is guarenteed NOT to be Space Invaders, Pac-Man, Breakout, Fruit Machine, or anything similar!

There is an undefined variable at the end of line 14 This is quite deliberate

```
1  REM  ZX81 HUMOUR"
2  PRINT  Q) WHAT IS THIS?"
3  PAUSE VAL "99"
4  FOR A = CODE  +  TO SIN PI STEP - SGN PI
5  GOSUB CODE "7"
6  CLS
7  NEXT A
8  FOR A = SIN PI TO CODE  + "
9  GOSUB CODE "7"
10 IF A = CODE  +  THEN GOTO CODE  $"
11 CLS
12 NEXT A
13 PAUSE VAL "300
14 PRINT AT VAL  19" VAL  15   OF" AT VAL
   "17 VAL  5   A) THE " CHR$ VAL  56  CHR$
   VAL  46" CHR$ VAL  56" CHR$ VAL  42"
   AND " CHR$ VAL  43  CHR$ VAL  38  CHR$
   VAL  49  CHR$ VAL  40" Z
15 PRINT AT A, VAL  12" CHR$ VAL  45" CHR$
   VAL  41  CHR$ VAL  46  CHR$ VAL  9  CHR$
   VAL  36" CHR$ VAL  50  CHR$ VAL  46
   CHR$ VAL  51"
16 FOR B = SGN PI TO VAL "3
17 NEXT B
18 RETURN
```

The *And* in line 14 is a keyword The *For — Next* loop in lines 16 and 17 is used as a time delay If you use *Pause*, the screen will flicker



Cruising Challenge

First there was *Space Invaders* then there was *Pacman* — now there is *Cruising* This all action machine code arcade type game will test your powers of co ordination to the limit Never before has a game asked you to think so quickly or move so fast

Achieving a high score on *Cruising* takes considerable skill and not a little practice Getting through the first four levels is not easy and that's just the beginning

Now you can make that skill work for you *Popular Computing Weekly* is offering £10 each month to the player with the highest score on *Cruising* All you have to do to enter this month's competition is send a print out of your highest score together with your name and address to

Popular Computing Weekly
Cruising Challenge
Hobhouse Court
19 Whitcomb Street
London WC2 7HF

Each month we will publish the name of the winner and the new *Cruising* high score Are you good enough to accept the Cruising Challenge?

The winner of last month's competition with a score of 9012 was N Darlow of Langleigh Road Ilfracombe Devon who receives £10 Entries for this month's competition close on April 30

Notes

1) Each entry must consist of a ZX … cut and your name and address
2) Closing date for this month's *Cruising Challenge* entries is April 30
3) The highest score each month will receive £10
4) High scores cannot be transferred from one month to another
5) The judges decision is final
6) No employees of Sunshine Publications Ltd or their families will be eligible to enter the *Cruising Challenge*
7) *Cruising (on Broadway)* for the 16K and 48K ZX Spectrum is available through W H Smith and leading computer stores for just £4 95 It is also available mail-order from Sunshine Books Ltd, Hobhouse Court 19 Whitcomb Street, London WC2 7HF

Hang It!

***Robert Turner** presents Hangman – an educational game for younger children*

This is the standard game of Hangman. The program takes up only 2½K of memory but as it uses Mode 2 graphics with 8 colours it will not run on a Model A.

At the start, you are asked whether you want to play a one or two player game. If your choice is the latter, one person has to type in his word while his opponent is not looking. The program will then proceed as normal.

For the one-player game, the words are contained in *Data* statements from line 660 onwards. In this version all the words are animals, although you can type in any words you wish. One point to bear in mind though is that if you have more than 90 words in the program, line 160 has to be changed to suit.

As an added attraction, the man's face turns blue at the end if you have lost.

NB. Did you know that the whole of the BBC's character set can be redefined using the normal *Vdu 23* command. This only works in the modes 0 to 6. If you press the *Break* key, however, and then change mode, the new characters will disappear.

Notes

10	Create array for letters in word
30	Initialise variables
40-70	Determine number of players
80-130	Define characters for man
140	Turn cursor off
160	Choose a random word
170-210	Draw border around screen
220-280	Print dashes and put each letter into array
290-390	Input letter and determine whether letter is correct
400-430	End of game round up if person has won
440-450	Make a beep and print letter in correct position
460-590	Draw gallows and man
600-650	End of game round up if person has lost
660-740	DATA containing words

```
LIST
    1 REM HANGMAN
    2 REM (C) ROBERT TURNER 1983
   10 DIM L2$(15):REM MAX. NO. OF
      LETTERS IS 10
   20 MODE2
   30 B%=0:PART%=0:M%=1:X%=0:L1%=0
   40 INPUTTAB(1,3)"DO YOU WANT TO
      PLAYA 1 OR 2 PLAYER GAME",OPTION
   50 IF OPTION=1 THEN GOTO 80
   60 PRINTTAB(1,6)"WHILE YOUR OPPO
      NENTIS NOT LOOKING INPUT YOUR WORD"
   70 INPUT WORD$
   75 REM USER DEFINED CHARACTERS
   80 VDU23,224,60,126,219,255,255,
      102,60,60
   90 VDU23,225,7,15,15,12,12,12,12,12
  100 VDU23,226,255,255,255,255,255,255,
      255,255
  110 VDU23,227,224,240,200,48,48,48,
      48,48
  120 VDU23,228,255,255,255,231,231,
      231,231,231
  130 VDU23,229,231,231,231,231,231,
      231,0,0
  135 REM TURN CURSOR OFF
  140 VDU23,8202;0,0,0;
  150 IF OPTION=2 THEN GOTO 170
  160 FOR WORD=1 TO RND(90):READ
      WORD$:NEXT
  170 CLS
  175 REM DRAW BORDER
  180 GCOL0,3:MOVE0,0
  190 DRAW0,1000
  200 DRAW1275,1000:DRAW1279,0
  210 DRAW0,0
  220 length%=LEN(WORD$)
  230 PRINTTAB(3,17);" ";
  240 FOR MINUSSIGN%=1 TO length%:
      PRINT"-";:NEXT
  250 FOR A%=1 TO length%
  260 L2$(A%)=MID$(WORD$,M%,1)
  270 M%=M%+1
  280 NEXT
  290 PRINTTAB(1,28);"LETTERS USED"
  300 COLOUR6:INPUTTAB(1,14)"TYPE A
      LETTER  "L1$:L1%=L1%+1
  310 PRINTTAB(L1%,30);L1$
  320 B%=0
  330 FOR A%=1 TO length%
  340 IF L2$(A%)=L1$ THEN GOSUB 440
  350 IF L2$(A%)=L1$ THEN X%=X%+1:B%=B%+1
  360 NEXT
  370 IF X%=length% THEN GOTO 400
  380 IF B%=0 THEN PART%=PART%+1:
      PROCHANGMAN
  390 GOTO 300
  400 COLOUR 10:PRINTTAB(4,19);"YOU HAVE
      WON":PRINT "     ANOTHER GAME ?"
  410 ANSWER$=GET$
  420 IF ANSWER$="Y" THEN RUN
  430 END
  435 REM SUBROUTINE IF LETTER IS RIGHT
  440 SOUND2,-12,135,10:PRINTTAB(3+A%,
      16);L2$(A%)
  450 RETURN
  460 DEFPROCHANGMAN
  470 SOUND1,-15,50,10
  480 ON PART% GOTO 490,500,510,520,530,540,
      550,560,570,580
  490 GCOL0,5:MOVE150,700:DRAW220,700:
      ENDPROC
  500 GCOL0,5:MOVE185,700:DRAW185,950:
      ENDPROC
  510 GCOL0,5:DRAW350,950:ENDPROC
  520 GCOL0,5:MOVE185,875:DRAW250,950:
      ENDPROC
  530 GCOL0,5:MOVE350,950:DRAW350,900:
      ENDPROC
  535 REM PRINT DIFFERENT PARTS OF MAN
  540 COLOUR3:PRINTTAB(5,4);CHR$224:
      ENDPROC
  550 COLOUR1:PRINTTAB(5,5);CHR$226;TAB(5,
      6);CHR$226:ENDPROC
  560 COLOUR1:PRINTTAB(4,5);CHR$225:ENDPROC
  570 COLOUR1:PRINTTAB(6,5);CHR$227:ENDPROC
  580 COLOUR4:PRINTTAB(5,7);CHR$228;TAB(5,8);
      CHR$229
  585 REM MAN'S FACE TURNS BLUE
  590 COLOUR 4:PRINTTAB(5,4);CHR$224
  600 COLOUR10:PRINTTAB(9,5);"HARD LUCK !"
      TAB(9,7);"YOU LOST"
  610 PRINTTAB(2,20);"  THE WORD WAS  ",
      TAB(3,22);WORD$
  620 PRINTTAB(8,10);"PLAY AGAIN ?"
  630 D$=GET$:IF D$="Y" THEN RUN
  640 END
  650 ENDPROC
  660DATA "DRAGON","ALBATROSS","HAWK",
     "AARDVARK","SWAN","LYNX","CAT","DOG",
     "FISH","BEAR"
  670DATA "KANGAROO","OPOSSUM","MONKEY",
     "LION","FOX","ARMADILLO","ANTEATER",
     "MOUSE","CHINCHILLA","SQUIRREL"
  680DATA "PORCUPINE","COYPU","OTTER","WOLF",
     "JAGUAR","OCELOT","AGOUTI","SKUNK",
     "DEER","TAPIR"
  690DATA "LLAMA","PUMA","GORILLA","CHIMPAN
     ZEE","EMU","LEOPARD","BABOON","CHEETA
     H","HYAENA","JACKAL"
  700DATA "ELEPHANT","GNU","GIRAFFE","GAZE
     LLE","RHINOCEROS","ANTELOPE","ZEBRA","
     BUFFALO","HIPPOPOTAMUS","CAMEL"
  710DATA "ORANGUTAN","TIGER","CHINCHILLA","
     RABBIT","CHIPMUNK","BEAVER","RACCOON
     ","COYOTE","COUGAR","MOOSE"
  720DATA "GOAT","OX","HEDGEHOG","MOLE","SHREW"
     ,"HARE","DORMOUSE","LEMMING","REI
     NDEER","POLECAT"
  730DATA "BOAR","BADGER","PLATYPUS","POSSUM"
     ,"KOALA","WOMBAT","WALLABY","DINGO"
     ,"GIBBON","MONGOOSE"
  740DATA "LADYBIRD","PANDA","WORM","GRIZZLY",
     "HORSE","HAMSTER","BLACKBIRD","DUC
     K","AARDWOLF","GOLDFISH"
```

A whole new horizon

***Malcolm Davison** shows that the Spectrum's visual vocabulary is larger than you might think*

A B
1 + =
2 + =
3 + =

Early impressions of the Spectrum character set may lead one to think that its visual vocabulary is not large The following program (which you will find in Chapter 14 of the Spectrum Manual) prints out the entire Spectrum character set

The scope is widened when you make use of the user-defined graphics However it is the statement *Over* that opens up a whole new horizon — instantly giving access to more than 30 000 characters

The combination of two or more characters overprinted on the same print position gives a result that is not what one might expect (see illustration) The ground rules are as follows — where *Ink* lands on *Ink* the result is *Paper*. *Paper* plus *Paper* gives *Paper* and *Paper* plus *Ink* gives *Ink* Now let's see what actually happens in practice

The program *Overlay* selects two characters at random with codes between 33 and 143, and then overprints them If you would like to see all the combinations, you could logically step through them all using a pair of *For* *Next* loops, but that would give you over 13,000 screens of information — and if you wanted to print them out, a few rolls of paper, too! Incidentally, if you would like to print out each screen — add 283 *Copy*

It will be quickly apparent that the majority of characters created are unlikely to be of use to man or beast — but there are many combinations that may be useful in games programs or for building up designs Using the program *Overlay2* try a few of the combinations below

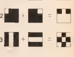
% # spaceship?
* > plane?
c D bullet?
inv © 4 insect?
* I flame at the base of a rocket?
Q] head of a Martian?
A1 lunar landing module?

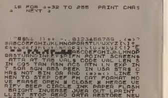
Perhaps my suggestions of their appearance are a bit far-fetched but in the context of the program might be readily accepted Where character combinations have a matching 'mirror image' about the *x* and *y* axes attractive borders can be created (see the examples) Try also

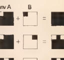
%▬ I■4 ■ ■<

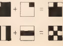
I hope these ideas will be helpful If you make use of your own user-defined graphics, the combinations are literally endless I shall be interested to see how other programmers make use of this intriguing statement

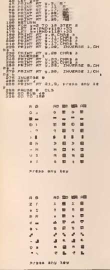
Now for the really intrepid explorer why not try overprinting three or more character? Best of luck! (If you want a foretaste of this try leaving out *Cls* in line 550 of *Overlay2*)

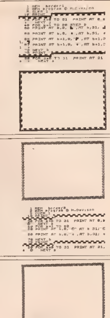




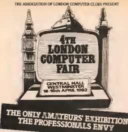








```
   1 REM "overlay2"
   2 LET a$="0"  LET b$="0"
 150 FOR y=0 TO 20 STEP 2
 160 INPUT a$
 170 INPUT b$
 175 PRINT AT y,12,a$
 180 PRINT AT y,14,b$
 200 PRINT AT y,17,a$
 210 PRINT AT y,17,b$
 300 PRINT
 400 NEXT y
 500 INPUT "Do you want a
copy?",a$
 510 IF a$="n" OR a$="N" THEN
GO TO 550
 520 COPY
 550 CLS   GO TO 150
```



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TRADE ENQUIRIES WELCOME PCW02

Colour combination . . .

***Dan Smith** explains how to use a Tandy CGP-115 printer with the BBC model B*

The new Tandy CGP-115 four-colour graphics printer is an attractive proposition, at about £100 less than a cheap dot matrix machine. The paper-width of 4½ inches is adequate for home use but the use of special ball-pens in place of the more usual impact pins may prove more expensive. Against this, the Tandy 'writes' in four colours *and* gives true descenders on letters like g j p y, etc.

The CGP-115 operation manual naturally only covers use with Tandy computers, but the commands are easily adapted for operation with the BBC Model B with a parallel cable. The following program shows how text and graphics modes of printing may be used with the BBC microcomputer.

Notes

Line(s)	
10 & 20	Clear the screen and display the program name *Plotter*
40	Tells the computer to send printer output to the parallel port (for serial output, you should type *FX5,2)
50	Turns on the printer
70	Puts the printer into Graphics Mode (VDU 1 18) and then moves the pen 100 units of 0.2mm each across the paper
90 120 150 180	Determine the printing direction by 'Q' commands
110 140 170 190	Decide the pen colour to be used the 'C' commands
200	Puts the printer back into Text Mode for the next 3 lines in order to move the paper up by 5 text lines.
240	Sets the printer back into Graphics Mode and the 'S4' command determines the size of letters (18 characters per line) in the word *Graphics* to be printed at line 260
250	Changes colour again (to blue from red)
260	The 'R' command moves the pen relatively 10 spaces
290-360	Draw the circle with a radius of 125 units (of 0.2mm each)
370	Reduces text size back to normal 40 characters per line.
380	Returns the colour to black
390	The 'A' command puts the printer back into Text Mode
400-420	Move the paper up by 10 text lines.
430	VDU3 turns off the printer

Printer Plotter Black
Printer Plotter Blue
Printer Plotter Green
Printer Plotter Red
GRAPHICS

```
>LIST
   10 MODE7
   20 PRINT TAB(12)'P l o t t e r"
   30 N$="Printer Plotter"
   40 *FX5,1
   50 VDU2
   60 PRINT
   70 VDU1,18.PRINT "M100,0'
   80 READ C$
   90 PRINT"Q0":PRINT"P";N$;' ';C$
  100 READ C$
  110 PRINT"C1"
  120 PRINT"Q1':PRINT"P",N$,  ",C$
  130 READ C$
  140 PRINT"C2'
  150 PRINT"Q2":PRINT "P';N$;   ';C$
  160 READ C$
  170 PRINT"C3"
  180 PRINT'Q3":PRINT"P",N$,    ,C$
  190 PRINT'C0'
  200 VDU1,17
  210 FOR K=1 TO 5
  220 VDU1,10
  230 NEXT K
  240 VDU1,18:PRINT'S4'
  250 PRINT"C1'
  260 PRINT"R10,0' . PRINT'PGRAPHICS"
  270 PRINT"C3"
  280 VDU1,18
  290 FOR Z=125 TO -125 STEP -5
  300 H=INTSQR(125*125-Z*Z)
  310 PRINT"D";Z+225",";H+10
  320 NEXT Z
  330 FOR Z=-125 TO 125 STEP 5
  340 H=-INTSQR(125*125-Z*Z)
  350 PRINT"D";Z+225",";H+10
  360 NEXT Z
  370 PRINT"S1"
  380 PRINT"C0"
  390 PRINT"A'
  400 FOR L=1 TO 10
  410 VDU1,10
  420 NEXT L
  430 VDU3
  440 DATA Black, Blue, Green, Red
```

Plotting a course . . .

***Richard Dodd** presents a graph plotting routine for the Dragon 32.*

This line graph program enables you to enter a maximum of 235 values. The computer will then print the highest value, the lowest value and the average. Then the values will be scaled down if necessary.

Next the computer will scale and draw the two axis. Then the points will be plotted and joined up. Lastly the average line will be drawn in.

Notes

50-90	Prints instructions
100-170	Inputs points
180-280	Scales down the values if necessary
285-365	Calculates the highest, lowest and average and prints them
380-395	Reverses numbers
400-430	Stops before drawing
450-510	Draws and scales values
520-630	Draws graph
640-660	Draws average
670-680	Freezes picture

Variables

P	Number of points
B	Each point
A	FOR NEXT loop
S	Scale
C	FOR NEXT loop
T	Title
D	Position of title
LOW	Lowest number
F	FOR NEXT loop
HIGH	Highest number
AVERAGE	Average
G	FOR NEXT loop
H	FOR NEXT loop
I	FOR NEXT loop
T	FOR NEXT loop

```
0 REM ***line graph***
20 REM **    by       **
30 REM **richard dodd**
40 CLS
0 PRINT TAB(11);"LINE GRAPH"
0 PRINT TAB(11);"---- -----"
0 PRINT:PRINT  "THIS PROGRAM ENAB
   LES YOU TO    ENTER A MAXIMUM
   OF 235 VALUES."
5 PRINT "THE COMPUTER WILL JOIN
   THESE UP"
  PRINT"THE COMPUTER WILL SCALE
   DOWN THE VALUES IF NECESSARY"
0 PRINT TAB(12);"========"
  PRINT:INPUT "HOW MANY POINTS";P
  IF P,235 THEN GOTO 40
  DIM B(P)
  FOR A=1 TO P
  SOUND 30,1
0 PRINT @ 385,"POINT";A:INPUT B(A)
0 PRINT @ 413,"      "
70 NEXT A
  REM **SCALE**
  S=S+1
  FOR C=1 TO P:IF B(C)/S 148
   THEN 190 ELSE NEXT C
0 REM **TITLE & DATA**
9 PRINT:LINE INPUT "TITLE  ";T$
  CLS
  D=(32-LEN(T$))/2
  PRINT
0 PRINT TAB(D);T$
  PRINT
80 PRINT
285 LOW=B(1)
90 FOR F=1 TO P
  IF B(F) HIGH THEN HIGH=B(F)
0 IF B(F) LOW THEN LOW=B(F)
0 AVERAGE=AVERAGE+B(F)
0 NEXT F
  AVERAGE=AVERAGE/P
0 PRINT:PRINT"HIGHEST NUMBER=";
   HIGH
360 PRINT:PRINT"LOWEST NUMBER="
   LOW
365 PRINT:PRINT"AVERAGE=";AVERAGE
370 REM **REVERSE NUMBERS**
380 FOR G=1 TO P
390 B(G)=178-(B(G)/S)
400 REM **STOP BEFORE DRAWING**
410 A$=INKEY$
420 PRINT:PRINT"TYPE 'C' TO
   CONTINUE"
430 IF INKEY$  "C" THEN GOTO 430
440 CLS
450 PMODE 4,1:PCLS:SCREEN 1,0
460 REM **SCALE & DRAW AXIS**
480 LINE(20,10)-(20,178),PSET
490 FOR G=10 TO 178 STEP 4
500 LINE(15,G)-(20,G),PSET
510 NEXT G
520 REM **PLOT GRAPH**
530 FOR H=20 TO 255 STEP INT
   ((235/P)+1)
540 LINE(H+1,183)-(H+1,178),PSET
550 NEXT H
560 FOR I=20 TO 255 STEP INT
   ((235/P)+1)
570 J=J+1
580 SOUND 150,1
590 PSET (I,B(J),1)
600 IF J=1 THEN LINE(255,178)-(2
   178),PSET:LINE-(I,B(J)),FRE
   NEXT I
610 LINE-(I,B(J)),PSET
620 FOR T=1 TO 500:NEXT T
630 NEXT
640 REM **DRAW AVERAGE**
650 LINE (20,178-(AVERAGE/S))-(2
   178-(AVERAGE/S)),PSET
660 LINE(20,10)-(20,178),PSET
670 GOTO 670
680 END
395 NEXT G
```



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VIC CARTRIDGE. The Count to swap for Adventure Land Pirate Cove or Omega Race Tel Chris Oxford (0865) 247636 (anytime).

ASR 33 TELETYPE, paper tape printer P S manuals very good condition £100 Tel Corby 3614 (after 7 pm)

SHARP M280K, 48K complete with Basic manual The Valley adventure game £250 Tel 0438 57027 (after 8 pm)

2 CARTRIDGES, 1 Star Basic only 2 weeks old 1 Jelly Monsters £15 each for Vic20 Tel. Sunodmete 453166 after 5 pm

DRAGON 32 with joysticks books £100 of software condition as new £200 Tel 0273 582211

JUPITER ACE, Forth sound graphic, 7 games £75 ono + p & p Tel Colchester (0206) 330621 (pm)

2 VIC20 16K ADVENTURES — Tombs of Druin + Star Trek for machine-code monitor Tel 516 2686

ATARI VCS + 7 cartridges including Asteroids War Lords, Mars Revenges + Star Wars etc, original books £135 Tel (Leatherhead) 0372 376683

BBC/TORCH twin disc drive - ZX second processor Including extra 64K Ram new will accept £750 Tel 0344 886176 (anytime)

DRAGON 32 with joystick books + software for Atari 400 with tape recorder Tel 518 1839

DRAGON 32, joystick 2 cartridges + cassettes £200 Tel Romford 29591

EDUCATIONAL GAMES for Commodore 64 or Arcade game for 64 price range from £4 95 to £8 95 Tel 01-452 4856

TEXAS INSTRUMENTS TI99-4a home computer 26K Rom 16K Ram also includes joysticks Pacman + Chess modules all new unused £170 ono or will split Tel 01 556 0767

DRAGON 32 with joysticks + cassette deck, £200 game Tenzor like Pac-Man, £8 Tel (Mike) Bedford 42024

OSBORNE 1 brand new Words Star and Super Calc £995 Tel 04862 26920

VIC20 ADVENTURE CARTRIDGES, Omego Race Orf Sargon Chess £12 each Rat Race Road Race Jelly Monsters Alien + Cloudbursts. £8 each Tel 574 4122

SPECTRUM TAPE, contains some of my old Spectrum games including Hobbit Orbitor Penetrater Gulpmen VU Vd only £10 Tel (David) 064 881279

COMPUTER BATTLE SHIPS for 3K Vic20 Ram Tel 761 5193 after 6 pm

POPULAR COMPUTING WEEKLY, all issues except 2 21 36 (Vol 1) 50p each or 3 for £1 Vic20 Cosmiads Ski Run Amok Moons of Jupiter offers Tim tel 0825 4524

VIC CARTRIDGES SWAP for cassette software Tel 01 574 4122

8K CARTRIDGE for Vic20 £40 Tel 21784 2038

VIC20 unexpanding colour high resolution graphics + sound games Frogger Skier Bomber and Astro Blaster all joystick controlled etc on one cassette for only £3 50 including p & p Tel Norwich 47582

MICRODEAL CASSETTES for Dragon 32 at £8 each Space War Alcatraz Mansion Adventure Racecball Call Paul on 061 263 8351 after 6 pm

SWAP 3K CARTRIDGE for Vic20 for any other games cartridge + swap Adventure Land for Pirate Cove Voodoo Castle or The Count Tel 061 327 2155

DRAGON 32 CASSETTE Space Monopoly £6 Tel 01-642 0889

OLIVETTI PRASIS 30 ELECTRONIC TYPEWRITER two extra daisywheels unused swap for Vic64 or sell for £300 Tel 0903 36780 evenings

RECORD PLAYER radio cassette recorder + 20 Astro Wars for a Dragon 32 Tel 88362 Ask for Daren

DRAGON 32 GAMES CARTRIDGE, Astro Blast boxed cost £20 sell for £12 Tel Brentwood 211710

THE STRONGEST chess playing computer that you can buy or £150 or will swap for Sinclair Spectrum Tel Doncaster 49475

Wanted

WANTED BBC A or B leads and manuals Greater Manchester area Tel 061-888 5023

PENTAX ME SUPER + extras £250 ono or swap for Vic20 + accessories Tel Harlow 413922 before 8.30 pm

WANTED ZX81, up to £30 Tel Ipswich (0473) 715646

WANTED VIC20 cartridges. Tel 01-954 4545

VIC20 CARTRIDGES or originial cassette for cash or swap Tel 01-574 4122 4pm-10pm

WANTED BBC SOFTWARE, will buy or swap P Stankevitch 213A Seneschal Square Southgate Runcorn Cheshire

BUGBYTE, Vicmen cassette Tel King St Athan 750996

WANTED Back issues of Danlog Datic and Compute! Contact J Bradbury Nottingham 703604

VIC20 CARTRIDGE Alien + £3 for an adventure cartridge Tel 01-942 9636

BBC Model A or B Telephone Coalville 37298

PROG S ACCESSORIES + printer for Pet 2001 8K Tel Byfleet 43331

BBC MODEL B good condition still under guarantee around £280-£300 Tel 01 722 8380 (anytime)

ANY second-hand games for Philips G7000 Tel Reading 883423

WANTED BBC Model B issues and price Tel 074-488 2631

10 GAMES CASSETTES, m/s tool 1 book 4 mile ZX printer paper Cost £75 sell £25 one Tel Silsby (0783) 53425

URGENTLY BBC MODEL B + Acorn printer Tel 0484 39295

WANTED GORFER SUPER LANDER, Vic20 cartridges Tel Leeds 742485 after 6 pm

ANY COMMODORE VIC20 Adventure cartridge Tel Leeds 742485

WANTED BBC B in exchange for stereo stack system worth over £700 Tel Hastings 438687

MOLE ATTACK cartridge for Vic20 wanted Other cartridges in exchange Tel Stevenage 811634 (after 8 pm)

COMPUTER BBC, Model B Tel 0782 504442.

TI99 4A Periverals Address 22 Downer Drive Sarratt Rickmansworth Herts

SPECTRUM 16K OR 48K (prefer 48K) + software Tel Plymouth 338666

BBC MODEL A OR B, must be in Scotland for viewing Tel 0383 7364208

BBC MODEL A, must be in very good condition Tel Edinburgh (031) 3326281

INTELLIVISION CARTRIDGES WANTED especially Tron deadly discs + Dungeons + Dragons Tel 01 887 8274 evenings (ask for Bruce)

BBC MODEL B Ring Mr Dejani 0952 505362 (during working hours)

COMMODORE O GRADE CASSETTES + super expander will swap for good cartridge software + other cassettes Tel 031-661 7477 after 5 pm

COMMODORE CASSETTE UNIT Tel 050 279427

WANTED, Vic 15-15 printer + leads Tel Gravesend 0474 84819 (day)

BBC B COMPUTER Please phone Weybridge 53680 (eve or weekend)

WANTED ZX81 add one Ram-pack, etc. will swap for BBC software including Acorn software Tel 05827 66053

ZX81 SPECTRUM, Vic20 etc, swap Armstrong 625 tuner amplifier Akai CS330 cassette deck + Pentax 35mm SLR camera + wide angle lens. Tel Saffron Walden 25076 (evenings or weekends)

ZX81 16K, as new + leads manuals £40 to £50 Leeds/Bradford area. Tel 0535 45770 (after 6 pm)

WANTED BBC (B) £300 Tel Pembroke (0646) 884080

BBC MODEL B North London or Enfield area Tel 01-805 2467

WANTED BBC Model B good condition Tel 01-653 8307 (after 6 pm)

WANTED BBC Model A or B Tel York 702311 or leave message at York 705418

ZX81 with/without 16K memory with instruction manuals Tel 01-676 1657 William Ramsden



COMMAND CLASS

A N Berry of Greenfields Drive, Little Neston, South Wirral, writes

Q **I have recently been *Peeking* around the Rom of my Spectrum looking for useful routines Most of the command routine addresses are stored in the command class table. Useful ones that can be called directly by machine code are *Cat . . . 6035 Stop . . 7406 New . . . 4535 Continue . 7775 Cls . . 7971 Return . . 7971 Copy . . 3756.***

But, the ones I am most interested in, the *Save* and *Load* routines, are not in this command class table Can you help me with the start address of these routines?

A The *Save* and *Load* routines are at 0605 and the locations of the address are stored at 1ADF and 1AD0 A book that you will find very useful is Ian Logan's *Disassembling your ZX Spectrum Rom* published by Melbourne House

WILL IT WORK?

R Machachlan of Craig Road, Workington, Cumbria writes

Q **I have a ZX Spectrum on order, but unfortunately I only have a Philips N2213 cassette recorder on which to *Save* and *Load* programs. This recorder only has a din socket, so I was wondering if I could use an adaptor to make it work on my Spectrum, with its *Ear* and *Mic* jacks.**

Also, I would like to know if any *Scramble* or *Defender* type games are going to be available for the 16K Spectrum?

A In short the answer to your first question is no A din plug such as that on the N2213 expects about 300 millivolts in and out The Spectrum needs 4 to 6 volts in, but only puts about 10 millivolts out I am afraid that you will need to get a cassette player that has Jack sockets Both Ferguson and Sanyo do a model that has both

In answer to your second question, try *Ground Attack* or *Orbiter* from Silversoft

SOFTWARE CHALLENGE

A Marsh of Monmouth Road, London N12 writes

Q **I have just bought a Commodore 64, after borrowing a Vic20 for a couple of weeks I would like to know whether or not a tool kit is yet available for the 64, as I am more interested in the challenge of writing software than buying it. If not, do you know when and if one will be available? Also, could you give me the relevant addresses and prices?**

A I know of only one tool kit for the Commodore 64 so far, though it is early days yet It is produced by DAMS Business Computers, Gores Road, Kirby Industrial Estate, Kirby Liverpool L33 7UA It is called *Vic-Aid*, though a Commodore 64 version is available The total price including VAT, is £22 94 However it needs to be used in conjunction with the DAMS *Ram n Rom* board which costs a further £26.39

IN DESPERATION

E Gerrard of St Hubert's Close, Gerrards Cross, Bucks SL9 writes

Q **I am the proud possessor of a Commodore 64, but am desperate for software I understand that part of the software support program will consist of Rom (Plug in) cartridges and I am anxious to know the following**

(a) When are they likely to be available in the UK?

(b) Are the cartridges currently available in the United States? If yes, are they compatible with the UK machine?

It has been suggested to me that cartridges designed for the American 110 volt system would not be compatible with the UK 240-volt system. If the answer to this is also yes, do you know where I could get a list of items available in America?

A The answer to your first question might well depend on who you ask Commodore told me that the first of its cartridges were already with the dealers — however they might well be filling back orders and so will not have any in stock This is news to Deans and Maplin in Hammersmith who have yet to see the machine let alone the cartridges

The only shop with Commodore 64 cartridges (that I know of) is the Vic Centre By the time you read this it should have close to a dozen titles in total, about half of which will be cartridges, from Kobra Micro Marketing The titles are, *Diary 64* (a form of database), *Forth Stat* (statistics) and *Graf* (graph) There should also be an up-rated form of *Visi-calc* that is both cartridge and disc

Although the Vic Centre does not know when it is going to be getting Commodore cartridges Commodore is talking about having a wide range of material available by May

STRANGE PROBLEM

Mark Anders of Eaglesham Road, Newton Mearns, Glasgow G77 writes

Q **Strange things are happening to my ZX81 It is difficult to explain exactly what is wrong, as one day the fault might be present, but on another day it might not It is all to do with Basic, as my machine code runs perfectly My 16K Ram pack is not the cause, but it is definitely one of the chips on the ZX circuit board Which one?**

I do not want to send it back to Sinclair because

(a) The time they take

(b) The guarantee has expired

(c) Anyway, they would not recognise the problem

Is there a chip responsible for the faint lines I get on the screen? Is there a cheaper way of replacing chips, other than by buying a new ZX81? I hope you can help me with these questions

A I can see why you do not want to send your ZX81 back

There could be one of two related reasons for your problems The machine could be overheating in which case a larger heatsink might well be the answer In practice, this usually comprises a piece of copper plate firmly bolted to the existing heat sink I have seen one made of 20-gauge copper plate that runs the entire length of the keyboard (in this case the keyboard is missing and another keyboard has been added)

Another solution to this problem is to wire a 2 7 ohms resistor into the power line, to take up some of the excess power being put in

● Postern has written to me (*Peek & poke* March 17-23), asking me to point out that it is not a cassette duplicating company, it is a software distribution and publishing company The company used for duplication is Kiltdale Ltd, and any further approaches should be made directly to Kiltdale Ltd, Liddington Trading Estate, Old Station Drive, Leckhampton Cheltenham

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can The address is *Peek & Poke, PCW*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

Top 10

Books

1	(—)	BBC Micro — An expert guide *James*	(Granada)
2	(1)	Assembly language programming for the BBC Micro *Birnbaum*	(Macmillan)
3	(2)	Enter the Dragon *Carter*	(Melbourne House)
4	(3)	Spectrum machine language for the absolute beginner *Tang*	(Melbourne House)
5	(5)	Mastering the Vic20 *Jones*	(Horwood)
6	(—)	Introducing Spectrum machine code *Sinclair*	(Granada)
7	(—)	Wordstar made easy *Ettlin*	(Osborne)
8	(7)	Programming the Z80 *Zaks*	(Sybex)
9	(—)	The Vic programmers reference guide *Finkel*	(Commodore)
10	(8)	Computes first book of Vic *Various*	(Compute)

(Figures compiled by Watford Technical Books, Watford 0923 23324)
(Last week's position in brackets)

Ziggurat



Above board?

As an interested observer of the software scene, I have noticed two major changes in the way in which software is being sold, or not sold.

Both these developments are illuminating examples of initiatives which I feel will have a long term adverse affect on the provision of software.

The first change is the proliferation of software libraries. Though many, we are told, are honest and upright (and pay royalties for the use of the programs to the owner/author of the program) some are not. Given my estimation of human nature, most will not be so above board.

There is an obvious parallel with video libraries. I was sitting on the bus one day (going to work) when I noticed that the person next to me on the seat had a video of *ET* — obviously bootleg.

Some software libraries might contend that they were only performing the same function as the lending libraries for books: after all, books are (in a sense) even more "copyrightable" than programs. This is true, but even with ordinary libraries authors have managed to establish a "public lending right", and get fees based on how often their books are taken out of selected public libraries. How is one able to establish a public lending right for programs, with all the very small (unknown and unofficial) lending libraries?

I want to rename the lending libraries "copying libraries" because that is what they are in most cases. The owners of the copying library may have rules which *forbid* copying — but it is a strong willed library member who holds back from copying.

It has taken a while for some user groups, well-known beds of copying, to realise that it is not clever to borrow some software from a dealer and then copy it wholesale — dealers are not stupid, and do not let this carry on for long.

The strategies software writers will have to use will raise the price of software (already far too high in some cases) further upwards, and programs will each have an individualised number with some protection against tampering.

The inevitable result will be that ultimately the user will find less software available and will have to start writing — people will play *their* own games.

The second development is those firms which offer to buy your programs and then sell them on a royalty basis. At one time, the standard way for programs to be sold was for a person to call him/herself something like *Stratospheric Software*, make immense claims about the zoominess, wanginess and kerputiness of its programs and offer to send them to you within 28 days, quite often the cheque being banked weeks before your programs arrived.

Reading a report of one such young entrepreneur, I was struck by the general feeling of amateurism. Fine, but I am not sure whether I would be happy to trust my affairs (or programs) to such a person. Again, all such firms are different, and it is impossible to generalise. Think, though, why so many people want your programs and think, then, that many of those programs will have been written by people such as yourself.

James Thurber wrote that "It is better to know some of the questions than all of the answers". ■

Boris Allan

Puzzle

A fishy problem

Puzzle No 50

As an end-of-day treat, all the stars of the Winterland Dolphinarium were given sprats for tea by their head trainer, one Archibald Aqualung.

All the dolphins were given the same number of fish but, when the porpoises came to receive theirs, Archy realised that he would not have enough to go round. So he had to give each porpoise four fewer sprats than he had given each dolphin.

In all he gave out four gross of fish. How many porpoises were there if the total number of animals fed was 31?

Solution to Puzzle No 45

As we are limited to 10 digits, the answer must lie between 47 and 99 — ie, numbers with a 4-digit square and 6-digit cube.

These are entered into string *A$*, and checked for duplication of digits.

```
10 FOR N = 47 TO 99
20 LET B$ = STR$ ( N * N)
30 LET C$ = STR$ (N * N * N)
40 LET A$ = B$ + C$
50 FOR M = 1 TO 9
60 FOR L = M + 1 TO 10
70 IF A$(M) = A$(L) THEN GOTO 110
80 NEXT L
90 NEXT M
100 PRINT "THE ANSWER = "N" SQUARE =
     "N*N" CUBE= "N*N*N
110 NEXT N
```

This gives the answer of 69 and the discs are arranged 4 7 6 1 (= 69½) and 3 2 8 5 0 9 (= 69⅓).

Winner of Puzzle No 45

The winner of Puzzle No 45 is Andrew McFadyean, Bradford Road, Birstall, West Yorks, who receives £10.

Top 10

ZX81*

1	(2)	Flight Simulation	(Psion)
2	(1)	Galaxians	(Artic)
3	(6)	Chess	(Artic)
4	(3)	3D Defender	(JK Greye)
5	(7)	Do not pass go	(Workforce)
6	(—)	Froggy	(D J L)
7	(—)	Gauntlet	(Colourmatic)
8	(—)	Trader	(Pixel)
9	(—)	Gulp 2	(Campbell Systems)
10	(—)	Kong/Dreader	(T S Software)

*All 16K.
(Figures compiled by Buffer Micro Shop, London 01 769 2887)

Spectrum

1	(1)	Penetrator	(Melbourne House)*
2	(3)	Hobbit	(Melbourne House)*
3	(—)	Orbiter	(Silversoft)
4	(4)	Frogger	(A+F)*
5	(5)	Flight Simulation	(Psion)
6	(—)	Softek Compiler	(Softek)*
7	(7)	Micro Chess	(Artic)
8	(2)	Vu-3D	(Psion)*
9	(—)	Knight's Quest	(Phipps Associates)*
10	(8)	Black Crystal	(Carnell)*

*Requires 48K.
(Figures compiled by Buffer Micro Shop, London 01 769 2887)

Dragon

1	(5)	Donkey King	(Microdeal)
2	(2)	Dragon Trek	(Salamander)
3	(1)	Planet Invasion	(Microdeal)
4	(3)	Alcatraz II	(Microdeal)
5	(8)	Attack	[illegible]
6	(4)	Space Race	(Compusense)
7	(—)	Katerpillar Attack	(Microdeal)
8	(7)	Champions	(Peaksoft)
9	(—)	Pimania	(Automata)
10	(—)	Gempack IV	(Gem)

(Figures compiled by Dragon Dungeon, Ashbourne (0335 44626))

Atari

1	(—)	Zaxxon	(Datasoft)
2	(4)	Defender	(Atari)*
3	(5)	Eliminator	(Adventure International)
4	(8)	Floyd of the Jungle	(Microprose)§
5	(6)	Hel Cat Ace	(Microprose)†
6	(—)	Choplifter	(Broderbund)*
7	(—)	Strikes	(Adventure International)
8	(—)	Sea Dragon	(Adventure International)
9	(—)	Astro Chase	(First Star)†
10	(7)	Miner 2049er	(Big Five)

*Cartridge †32K cassette §32K disk
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

BBC*

1	(—)	Rocket Raid	(Acornsoft)
2	(6)	Creative Graphics	(Acornsoft)
3	(8)	Dragns and Chess	(Acornsoft)
4	(3)	Snapper	(Acornsoft)
5	(—)	Monsters	(Acornsoft)
6	(—)	Meteors	(Acornsoft)
7	(—)	Colossal Adventure	(Level 9)
8	(1)	Planetoids	(Acornsoft)
9	(—)	Business Games	(Acornsoft)
10	(—)	Algebraic Manipulation	(Acornsoft)

*All Model B.
(Figures compiled by Micro Management, Ipswich 0473 59181)

Vic20

1	(2)	Grid Runner	(Llamasoft)
2	(1)	Laser Zone	(Llamasoft)†
3	(—)	Avenger	(Commodore)*
4	(6)	Sargon II Chess	(Commodore)*
5	(—)	Colonel's House	(Rouse)††
6	(7)	Andes Attack	(Llamasoft)†
7	(5)	Rocket	(Rabbit)
8	(—)	Scramble	(Rabbit)
9	(—)	Vic Rescue	(Interceptor Micros)
10	(—)	Alien Attack	(Interceptor Micros)

*Cartridge †Requires 8K or 16K ††16K only
(Figures compiled by Vic Centre, Lokash 01-992 6904)

(Last week's position in brackets)




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